Vol. 1027 Number 4

# OFFICIAL GAZETTE

of the

# UNITED STATES PATENT AND TRADEMARK OFFICE

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Patent and Trademark Office

# OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

December 27, 1983 Volume 1037 Number 4


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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 1l(a)3 of Title 35, U.S. Code P.T.O.

# PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

| | |
|---|---|
| Transmittal fee | $ 125.00 |
| Search fee | |
| U.S. Patent and Trademark Office as Searching Authority | |
| · No corresponding prior U.S. national application filed | 500.00 |
| · Corresponding prior U.S. national application filed | 250.00 |
| European Patent Office as Searching Authority | |
| · All cases | 670.00 |
| International Fees | |
| Basic Fees (first 30 pages) | 265.00 |
| Basic Supplemental Fee (for each page over 30) | 5.00 |
| Designation fee (for each national or regional office) | 65.00 |

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

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### Board of Appeals Decisions Rendered in the Month of Nov. 1983

| | |
|---|---|
| Affirmed | 198 |
| Affirmed in Part | 23 |
| Reversed | 72 |
| Total | 293 |

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### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

**4,012,597,** Re. S.N. 548,793, Filed Nov. 4, 1983, Cl. 179/2E, TRANSMISSION TRUNK MULTICHANNEL DISPATCH SYSTEM WITH PRIORITY QUEUING, Charles N. Lynk, Jr., et al., Owner of Record: *Motorola, Inc., Chicago, Ill.,* Attorney or Agent: James W. Gillman, Ex. Gp.: 214

**4,120,289,** Re. S.N. 544,794, Filed Oct. 24, 1983, Cl. 123/271, REFRIGERANT CHARGED SOLAR WATER HEATING STRUCTURE AND SYSTEM, Edward W. Bottum, Owner of Record: *Inventor,* Attorney or Agent: Dale R. Small, Ex. Gp.: 344

**4,200,765,** Re. S.N. 538,866, Filed Oct. 4, 1983, Cl. 568/862, GLYCOL ALDEHYDE AND ETHYLENE GLYCOL PROCESSES, Richard W. Goetz, Owner of Record: *National Distillers and Chemical Corp., New York, N.Y.,* Attorney or Agent: John F. Scully, Ex. Gp.: 126

**4,228,076,** Re. S.N. 545,481, Filed Oct. 26, 1983, Cl. 264/321, METHOD OF DENSIFYING OPEN-CELLED POLYURETHANE MATERIAL, Winslow L. Pettingell, Owner of Record: *Foam Cutting Engineers, Inc., Chicago, Ill.,* Attorney or Agent: Ernest A. Wegner, et al., Ex. Gp.: 147

**4,253,478,** Re. S.N. 542,204, Filed Oct. 14, 1983, Cl. 135/68, FOLDING CRUTCH, Emm ett O. Husa, Owner of Record: *Inventor,* Attorney or Agent: Joan H. Pauly, et al., Ex. Gp.: 334

**4,291,062,** Re. S.N. 534,140, Filed Sept. 21, 1983, Cl. 424/322, PHARMACEUTICAL COMPOSITIONS CONTAINING UREA, Steven Leigh, et al., Owner of Record: *Phares Pharmaceutical Research N.V., Curacao, Netherlands,* Attorney or Agent: John E. Lind, Ex. Gp.: 125

**4,295,682,** Re. S.N. 509,352, Filed June 30, 1983, Cl. 297/367, SUPERFINE TOOTH SEAT BACK ADJUSTER, Bernd A. Kluting, et al., Owner of Record: *Keiper U.S.A., Inc., Battle Creek, Mich.,* Attorney or Agent: Lloyd M. Forster, Ex. Gp.: 355

**4,300,088,** Re. S.N. 549,731, Filed Nov. 8, 1983, Cl. 320/61, ELECTRIC CHARGING APPARATUS FOR GROUND VEHICLES, David E. Hicks, Owner of Record: *Inventor,* Attorney or Agent: Richard W. Hanes, Ex. Gp.: 214

**4,304,177,** Re. S.N. 544,025, Filed Oct. 21, 1983, Cl. 99/333, FOOD COOKING APPARATUS, Herbert H. Loeffler, et al., Owner of Record: *Arthur D. Little, Inc., Cambridge, Mass.,* Attorney or Agent: Arthur H. Seidel, Ex. Gp.: 242

**4,345,161,** Re. S.N. 542,727, Filed Oct. 17, 1983, Cl. 290/55, MULTI-WHEEL WINDMILL ELECTRO-GENERATOR, George Crompton, Owner of Record: *Inventor,* Attorney or Agent: G. Lloyd Knight, Ex. Gp.: 217

**4,351,494,** Re. S.N. 536,898, Filed Sept. 28, 1983, Cl. 242/35.5A, BOBBIN TRANSPORT APPARATUS AND METHOD, Heinz Schippers, et al., Owner of Record: *Barmag Barmer Maschinenfabrik Aktiengesellschaft Remscheid, Germany,* Attorney or Agent: Charles B. Elderkin, Ex. Gp.: 245

**4,353,780,** Re. S.N. 540,933, Filed Oct. 11, 1983, Cl. 156/664, CHEMICAL MILLING OF HIGH TUNGSTEN CONTENT SUPERALLOYS, Robert E. Fishter, et al., Owner of Record: *United Technologies Corp., Hartford, Conn.,* Attorney or Agent: Charles G. Nessler, Ex. Gp.: 161

**4,359,015,** Re. S.N. 545,841, Filed Oct. 27, 1983, Cl. 119/156, IDENTIFICATION TAG FOR LIVESTOCK, Eugene B. Ritchey, Owner of Record: *Inventor,* Attorney or Agent: Gary D. Fields, et al., Ex. Gp.: 333

**4,372,303,** Re. S.N. 548,186, Filed Nov. 2, 1983, Cl. 128/132D, BANDAGE FRAME AND METHOD, Frederic Grossman, Owner of Record: *American Hospital Supply, Evanston, Ill.,* Attorney or Agent: Donald L. Barbeau, Ex. Gp.: 335

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**No Publications This Issue**

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### Group Number on all Communications Going to the Examining Groups

Applicants and their attorneys or agents are reminded that the Group number should be typed on amendments and other communications relating to matters handled in the examining groups in order to expedite the processing of mail. The number of the Group should be placed on right-hand side, opposite the serial number or name of the applicant.

This reminder does not apply to notices and reasons of appeal to the United States Court of Appeals for the Federal Circuit. These communications should be sent to the Solicitor at the address below:

Solicitor
Box 8
U.S. Patent and Trademark Office
Washington, D.C. 20231

Attention to these details will improve the efficiency and reduce the time necessary to process incoming mail.

THERESA A. BRELSFORD,
Nov. 23, 1983. *Assistant Commissioner for Administration.*

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### Mailing of Papers to the PTO in Patent Interference Proceedings

Effective immediately, attorneys and agents are requested to address all papers mailed to the Patent and Trademark Office in connection with an interference proceeding, and any patent or application involved in an interference proceeding, as follows:

BOX INTERFERENCE
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Use of this address will considerably assist the Board in its administration of patent interference proceedings.

DONALD J. QUIGG,
Nov. 28, 1983. *Deputy Commissioner of Patents and Trademarks.*

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### Department of the Treasury
### United States Customs Service

Application for Recordation of Trade Name: "Zahnradfabrik Friedrichshafen, AG."

**Agency:** U.S. Customs Service, Department of the Treasury

**Action:** Notice of Application for Recordation of Trade Name

**Summary:** Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "ZAHNRADFABRIK FRIEDRICHSHAFEN, AG.," used by Zahnradfabrik Friedrichshafen, AG., a corporation organized under the laws of West Germany, located at D-7990 Friedrichshafen 1, West Germany.

The application states that the trade name is used in connection with the following merchandise manufactured and distributed throughout the world: gear units for machines; machine parts; brake testing stands; testing instruments and parts for land vehicles.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

**Date:** Comments must be received on or before (60 days from date of publication).

**Address:** Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Room 2417, Washington, D.C. 20229.

**For Further Information Contact:** Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

MARILYN G. MORRISON,
Oct. 21, 1983. *Acting Director, Entry Procedures and Penalties Division.*

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### National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

*Notice of Availability for Licensing*

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
*Program Coordinator,*
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-524,179. A SIMPLE AND RAPID METHOD FOR EXTRACTION OF PROTEINS FROM BACTERIA.

DEPARTMENT OF COMMERCE

SN 6-525,771. OPTICAL FIBER THERMOMETER.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-202,727 (4,397,552). INSTRUMENT FOR MEASUREMENT OF EXPOSURE FROM A LASER RADIATION.

SN 6-254,097 (4,408,124). BRH TEST PATTERN FOR GAMMA CAMERA PERFORMANCE (AN EVALUATOR).

SN 6-319,995 (4,395,395). DETECTION OF NON-A, NON-B HEPATITIS ASSOCIATED ANTIGEN.

SN 6-528,258. INACTIVATION OF VIRUSES CONTAINING ESSENTIAL LIPIDS.

DEPARTMENT OF THE AIR FORCE

SN 6-189,237 (4,397,147). POWER CIRCUIT UTILIZING SELF EXCITED HALL EFFECT SWITCH MEANS.

SN 6-210,476 (4,398,085). UNIVERSAL TIMING ARRAY.
SN 6-231,088 (4,398,792). HOLOGRAPHIC COUPLER FOR FIBER OPTIC SYSTEMS.
SN 6-235,488 (4,398,430). RUDDER PEDAL GRIP ASSEMBLY.
SN 6-242,502 (4,399,484). INTEGRAL ELECTRIC MODULE AND ASSEMBLY JET COOLING SYSTEM.
SN 6-242,817 (4,398,685). AERIAL DAY/NIGHT REFUELING STATIONS.
SN 6-251,823 (4,397,554). TRANSPARENCY HALATION MEASUREMENT METHOD AND APPARATUS.
SN 6-253,453 (4,398,161). PHASE-SHIFTING AMPLIFIER.
SN 6-297,459 (4,399,733). SEMIAUTOMATIC SWAY-BRACE.
SN 6-305,667 (4,400,669). MAGNETOSTATIC WAVE DELAY LINE HAVING IMPROVED GROUP DELAY LINEARITY.
SN 6-308,974 (4,396,201). MISSILE MOUNTED SEAL.
SN 6-324,899 (4,396,171). AIRCRAFT EJECTION SEAT CATAPULT DEVICE.
SN 6-329,443 (4,398,415). SWING LINK FLEXIBLE WIND TUNNEL NOZZLE.
SN 6-333,216 (4,399,005). METHOD OF NICKEL ELECTRODE PRODUCTION.
SN 6-342,995 (4,397,434). SURVIVABLE SATELLITE BUS STRUCTURAL.
SN 6-361,020. DEWAR COOLING CHAMBER FOR SEMICONDUCTOR PLATELETS.
SN 6-366,733 (4,400,540). OXY AND THIOARYL-PHENYLATED AROMATIC BISCYCLOPENTADIENONES.
SN 6-399,568 (4,400,411). TECHNIQUE OF SILICON EPITAXIAL REFILL.
SN 6-401,164. RADAR SYSTEM FOR REDUCING ANGLE TRACKING ERRORS.
SN 6-418,886 (4,396,459). METHOD AND SOLUTION FOR ETCHING INDIUM ANTIMONIDE.
SN 6-436,869 (4,400,221). FABRICATION OF GALLIUM ARSENIDE-GERMANIUM HETEROFACE JUNCTION DEVICE.
SN 6-448,161 (4,400,421). FOUR-DIRECTIONAL STRUCTURE FOR REINFORCEMENT.
SN 6-497,443. DISTORTION FREE FIBER OPTIC SYSTEM.
SN 6-512,848. PROGRAMMABLE LFM SIGNAL PROCESSOR.
SN 6-518,275. ROBOTIC ORDER PICKING.
SN 6-518,590. METHOD OF PRODUCING A BURIED LONG PERIOD GRATING.
SN 6-520,386. TESTING APPARATUS FOR AIRBORNE MISSILE SYSTEM.
SN 6-521,778. FLOURIDE GLASS COMPOSITIONS.
SN 6-521,803. RANDOM TIMER.
SN 6-523,550. PROCESS FOR THE DEPOSITION OF III-V COMPOUNDS USING ULTRA-VIOLET RADIATION.
SN 6-73,478 (4,398,686). TOWPLATE SYSTEM.

### DEPARTMENT OF THE ARMY

SN 6-311,370 (4,401,670). METHOD FOR TREATING GONORRHEA INFECTIONS WITH 2-ACETYL- AND 2-PROPIONYLPYRIDINE THIOSEMICARBAZONES.
SN 6-529,427. X-200 ELECTRICALLY CONDUCTIVE ADHESIVE.
SN 6-533,089. A LINEAR ARRAY ANTENNA EMPLOYING THE SUMMATION OF SUBARRAYS.

### DEPARTMENT OF THE INTERIOR

SN 6-258,076 (4,407,775). PRESSURELESS CONSOLIDATION OF METALLIC POWDERS.
SN 6-397,735 (4,409,189). RECOVERY OF TUNGSTEN FROM BRINES.
SN 6-460,102 (4,409,020). RECOVERY OF METALS FROM GRINDING SLUDGES.

### Status of PTO Services

The following is an update of the status of PTO services for November 1983 :

| Service Item | FY 1984 Performance Goal (Calendar Days) | Actual | Comment |
|---|---|---|---|
| Filing Receipts: | | | |
| Patents | 22 | 24 | |
| Trademarks | 30 | 30 | |
| Patent Copies: | | | |
| Window Coupons | 5 | 98% within 5 days | |
| Mail Coupons | 29 | 100% within 23 days | |
| Letter Orders | 34 | 100% within 29 days | |
| Date of oldest unfilled order | | Oct. 26, 1983 | |
| Certified Copies: | | | |
| Trademark Registrations | 30 | 11 | |
| Applications-As-Filed | 20 | 100% within 18 days | |
| File-Wrapper/Contents | N/A | 100% within 8 days | |
| Walk-up Certification | 1 | 99% within 1 day | |
| Trademark Search Library: | | | |
| Filing Drawings | 21 | 17 | |
| Filing Reg. Certificates | 3 | 3 | |
| Assignments: | | | |
| Patents | 25 | 20 | |
| Trademarks | 25 | 11 | |
| Avg. Days from Issue Fee Payment to Issue Date | 90-100 | 91 | |
| Patent Official Gazette: | | | |
| In Bookstore | Issue Date | On schedule | |
| Mailed | Issue Date | Avg. 1 day late | |
| Patent Grants Mailed | Issue Date | On schedule | |
| Patent Copies Available | Issue Date | Avg. 7 days late | Due to GPO delays; being investigated. |
| Trademark Official Gazette: | | | |
| In Bookstore | Issue Date | Avg. 1 day late | |
| Mailed | Issue Date | Avg. 2 days late | |
| Trademark Regs. Mailed | Issue Date | Avg. 2 days late | |

### IMPROVEMENTS TO SERVICES

- *File Wrapper Subscription Services Survey* — We plan to begin producing patented file wrapper microfiche in Jan. 1984. We are in the process of evaluating interest in a weekly subscription service for the patented file wrapper microfiche. The charge for this service may be as follows:

  A. Initial yearly charge (includes one subclass) $ 4.00
  B. Yearly charge for each additional subclass $ .40
  C. Charge for each file furnished $10.00

  Anyone interested should indicate the level of their interest (A. definite interest/would subscribe; B. tentative interest/may subscribe; or C. future interest/would subscribe in future) by writing:

  Mr. Frank V. Caesar, Director
  Office of Patent and Trademark Services
  Crystal Plz. #2, Room 7D25
  Washington, D.C. 20231

- *Group Number on all Communications Related to Pending Applications* — Applicants and their attorneys or agents are reminded that the Group number should be typed on amendments and other communications relating to matters handled in the examining groups in order to expedite the processing of mail. The number of the Group should be placed on the right-hand side, opposite the serial number or name of the applicant.

  This reminder does not apply to notices and reasons of appeal to the United States Court of Appeals for the Federal Circuit. These communications should be sent to the Solicitor at the address below:

  Solicitor
  Box 8
  U.S. Patent and Trademark Office
  Washington, D.C. 20231

  Attention to these details will improve the efficiency and reduce the time necessary to process incoming mail.

- *Transmittals for Use of Deposit Accounts* — When statutory fees are to be charged to a deposit account, the processing of the application can be facilitated by submitting the applicant's transmittal letter or other correspondence specifying the account to be charged in triplicate. Submission of these documents in triplicate will eliminate the need for the Mail Room to photocopy the document and thereby reduce the processing time of incoming mail.

- *Subject Matter Directory* — In the Nov. 29, 1983, Official Gazette, an up-to-date telephone directory was published. Following is an alphabetic directory, by subject or type of inquiry.

THERESA A. BRELSFORD,
*Assistant Commissioner for Administration.*

Dec. 2, 1983.

# PATENT NOTICES

**Certificates of Correction for the Week of Dec. 27, 1983**

| | | | |
|---|---|---|---|
| D. 252,042 | 4,376,879 | 4,390,507 | 4,404,762 |
| D. 267,834 | 4,377,831 | 4,391,290 | 4,405,056 |
| D. 269,968 | 4,379,495 | 4,393,110 | 4,405,305 |
| 3,855,079 | 4,379,672 | 4,393,237 | 4,405,494 |
| 4,042,397 | 4,379,761 | 4,395,876 | 4,405,746 |
| 4,249,735 | 4,380,303 | 4,397,913 | 4,405,887 |
| 4,289,842 | 4,381,052 | 4,398,031 | 4,406,286 |
| 4,289,844 | 4,381,570 | 4,399,008 | 4,406,673 |
| 4,289,867 | 4,381,746 | 4,399,255 | 4,407,022 |
| 4,294,965 | 4,382,433 | 4,399,535 | 4,407,231 |
| 4,300,018 | 4,382,555 | 4,400,054 | 4,407,254 |
| 4,302,784 | 4,382,838 | 4,400,711 | 4,407,437 |
| 4,313,445 | 4,383,250 | 4,400,757 | 4,407,609 |
| 4,324,916 | 4,383,263 | 4,400,962 | 4,407,666 |
| 4,328,810 | 4,383,556 | 4,401,134 | 4,407,935 |
| 4,339,990 | 4,383,887 | 4,401,743 | 4,408,184 |
| 4,351,070 | 4,383,967 | 4,401,814 | 4,408,540 |
| 4,351,293 | 4,384,045 | 4,401,855 | 4,408,545 |
| 4,353,851 | 4,384,708 | 4,402,040 | 4,409,594 |
| 4,359,714 | 4,384,805 | 4,402,703 | 4,410,837 |
| 4,365,177 | 4,384,905 | 4,403,199 | 4,412,064 |
| 4,366,621 | 4,386,220 | 4,403,383 | 4,414,129 |
| 4,367,524 | 4,387,171 | 4,403,490 | |
| 4,368,298 | 4,387,229 | 4,404,180 | |
| 4,371,063 | 4,387,966 | 4,404,733 | |

**Disclaimer**

3,848,115.—*Edwin A. Sloane* and *Charles L. Heizman,* Los Altos, Calif. VIBRATION CONTROL SYSTEM. Patent dated Nov. 12, 1974. Disclaimer filed Oct. 11, 1983, by the assignee, *Genrad, Inc.*

Hereby enters this disclaimer to claim 15 of said patent.

4,364,397.—*Paul Citron,* New Brighton, *Dennis G. Hepp,* Coon Rapids, and *Thomas L. Jirak,* Plymouth, Minn. APPARATUS FOR MONITORING THE RHYTHM OF A PATIENT'S HEARTBEAT. Patent dated Dec. 21, 1982. Disclaimer filed Sept. 26, 1983, by the assignee, *Medtronic, Inc.*

The term of this patent subsequent to Nov. 23, 1999, has been disclaimed.

## SUBJECT INDEX


| INQUIRY | CONTACT POINT |
|---|---|
| Addressees, PTO Special | See Special PTO Boxes |
| Amendments (Patent) | |
| General Information | 557-3256 |
| Specific Case | Appropriate Examining Group |
| Applications | |
| Patents - General Information | 557-3256 |
| PCT - General Information | 557-2003 |
| Re-Examination Unit - General Information | 557-1562 |
| Trademarks - General Information | 557-3268 |
| Assignments | 557-3266 |
| Attorney's Roster | 557-1728 |
| Attorney's Window | 557-3480 |
| Cashier's Window | 557-3230 |
| CASSIS Coordinator | 557-0400 |
| Certificates of Correction | 557-0708 |
| Classification Definitions and Orders | 557-5103 |
| Classification of Published Patents | 557-3951 |
| Congressional Affairs | 557-1310 |
| Copies | |
| Title Unit | 557-3826 |
| Certified Copies | 202/377-3359 |
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| Foreign Patents | 557-3545 |
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| Patents | 202/377-2535 |
| Trademark Applications | 202/377-3359 |
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| Duty of Disclosure Matters | 557-8384 |
| Employment | 557-1208 |

| INQUIRY | CONTACT POINT |
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| (Managers Office) | 557-2469 |
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| Abandoned Applications - Patents and Trademarks | 557-1625 |
| Patented Files | 557-1626 |
| Trademark Registrations | 557-3281 |
| **Forms** | |
| Patents | 557-3080 |
| Trademarks | 557-3080 |
| PCT (Patent Cooperation Treaty) | 557-2003 |
| **Fraud** | 557-8384 |
| **Information, General** | 557-3080 |
| **Journal of Patent Office Society** (JPOS) | |
| Editor, Gerald H. Bjorge | |
| Managing Editor, J. Robert Largen | |
| Note: All questions should be addressed to: | |
| Box 2600 | |
| Arlington, Virginia 22202 | |
| **License** (Request to file patent application abroad) | 557-2167 |
| **Mail Receipt** | 557-3232 |
| **Manual of Classification** | |
| General Information | 557-5103 |
| Index to | 557-0400 |
| **Manual of Patent Examining Procedure** (MPEP) | 557-3070 |
| **Master Classified File (MCF)** | 557-0400 |
| **Notice of Allowance** | Appropriate Examining Group |
| Balance of Issue Fee | 557-3293 |

| INQUIRY | CONTACT POINT |
|---|---|
| **Notices of Appeal** | |
| Board of Appeals | 557-4101 |
| Trademark Trial and Appeal Board | 557-3551 |
| Court of Appeals for the Federal Circuit (CAFC) | 557-4035 |
| **Official Gazette** | 557-3794 |
| **Official Gazette** (Government Printing Office) | |
| Subscription Problems | 202/275-3054 |
| **Patent Application Information** | |
| Pre-Examination | 557-3254 |
| Examination | Appropriate Examining Group |
| Post-Examination | 557-3283 |
| **Patent Classification** | 557-0400 |
| **Patent Depository Library Coordinator** | 557-0400 |
| **Patent Depository Library Program** | 557-0400 |
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| Re-Examination Examiners | Appropriate Examining Group |
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| Status and Location | 557-1625 |
| Examination Information | Appropriate Examining Group |
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| **Petitions, Patents** | |
| Holding of abandonment, invoking supervisory authority of the Commissioner | Appropriate Examining Group Director |

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| Suspension of rules relating to the examining of patent applications | Deputy Assistant Commissioner for Patents 557-2621 |
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**Patents** ..... Numbers 3,243,822 to 3,248,737, inclusive

**Plant Patents** ..... Numbers 2,616 to 2,627 inclusive

# REISSUES

## DECEMBER 27, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

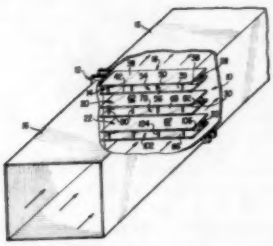
### Re. 31,471
### MULTIPLE BLADE DAMPER ASSEMBLY

**Donald K. Hagar, Allentown, Pa., assignor to Damper Design, Inc., Allentown, Pa.**

**Original No. 4,191,212, dated Mar. 4, 1980, Ser. No. 798,166, May 18, 1977. Continuation of Ser. No. 156,673, Jun. 5, 1980, abandoned. Application for reissue Jan. 11, 1982, Ser. No. 338,557**

**Int. Cl.³ F16K** *1/22;* **F24F** *13/16*

**U.S. Cl. 137—601** **23 Claims**



*20. A damper for a duct comprising a frame defining a rectangular opening and mountable in said duct and at least two blades extending across said opening and journaled in said frame to rotate about parallel axes from edge-to-edge closed positions forming a common barrier across said opening to open positions in parallel planes, each blade including a pair of spaced, flat parallel plates joined together with connecting members, the space between the plates of each blade defining a substantially unrestricted open fluid passageway through such blade, each plate of each blade including a pair of edges extending parallel to the axis of rotation of each blade, one edge of one plate and one edge of the other plate defining a first open aperture of each blade, the other edge of said one plate and the other edge of said other plate defining a second open aperture, one of said apertures providing an inlet and the other of said apertures providing an outlet to said fluid passageway of each blade to permit flow of fluid therethrough, each plate including sides parallel to said edges of said plates and in face-to-face relationship with said frame, means for maintaining a predetermined clearance between said sides and said frame, said maintaining means including a movable member disposed on one of said sides of each blade and between said plates thereof, a bearing between said frame and said movable member and biasing means urging said movable member toward said frame, said movable member having an outer extremity disposed adjacent said frame, said bearing being so disposed with respect to said movable member and said frame as to provide the predetermined clearance between said outer extremity and said frame, said biasing means allowing said moving means to move with respect to said blade upon thermal expansion to maintain said predetermined clearance.*

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### Re. 31,472
### IGNITION CABLE TERMINAL CONSTRUCTION

**James M. Keiler, Burtchville Township, Saint Clair County, Mich., assignor to Allied Corporation, Morristown, N.J.**

**Original No. 4,284,322, dated Aug. 18, 1981, Ser. No. 100,771, Dec. 6, 1979. Application for reissue Nov. 27, 1981, Ser. No. 325,474**

**Int. Cl.³ H01R** *11/08, 43/04*

**U.S. Cl. 339—223 S** **9 Claims**

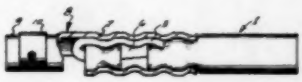
*8. A method of attaching a terminal to a cable, said cable having a central conductive core, and an outermost insulating layer concentric with and surrounding said central conductive core, comprising the steps of:*

*forming an exposed core end portion by removing said outermost layer from said central conductive core for a predetermined distance from an end of said cable; then*

*placing a narrow strip of conductive sheet material in a circumferential direction with respect to said cable and in contact with substantially more than half of the circumference of said outermost insulating layer adjacent said core end portion; then*

*bending said core end portion back over said sheet material; and then*

*clamping a terminal ferrule over said core end portion, said*



*sheet material and said outermost insulation layer to make direct electrical contact between said core end portion and said ferrule.*

*9. A cable assembly having an outermost insulating layer and a central conductive core and a terminal ferrule fastened to said cable at an end thereof, characterized in that a predetermined length of said conductive core is exposed at said end of said cable, a portion of said exposed core is bent back over said outermost insulating layer, and a narrow strip of sheet material is disposed in a circumferential direction with respect to said cable and in contact with substantially more than half of the circumference of said outermost insulating layer and interposed between said bent back portion of said exposed core to form a permanent electrical connection between said core and said ferrule.*

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### Re. 31,473
### SYSTEM FOR FABRICATION OF SEMICONDUCTOR BODIES

**Jack S. Kilby, Dallas; William R. McKee, Plano, and Wilbur A. Porter, College Station, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Original No. 4,188,177, dated Feb. 12, 1980, Ser. No. 766,223, Feb. 7, 1977. Application for reissue Mar. 2, 1982, Ser. No. 354,015**

**Int. Cl.³ B29C** *23/00;* **B29D** *31/00*

**U.S. Cl. 425—6** **3 Claims**

**[**5. The combination set forth in claim **4**, wherein**]** *A system for forming small semiconductor bodies of near uniform size with minimal grain boundaries from bodies of semiconductor material, which comprises:*

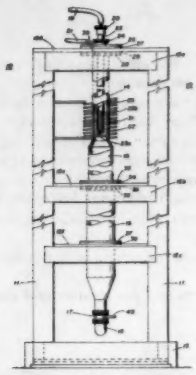
*(a) a feed tube for receiving said bodies;*

*(b) a heat susceptor encircling said feed tube and encompassing a free fall path below said feed tube;*

*(c) a tube enclosing said susceptor; and*

*(d) heating means encircling said tube for establishing a temperature level near said feed tube above the melting point of said semiconductor material and establishing a predetermined temperature gradient over the next lower portions of said free fall path to a temperature below said melting point, said*

heating means [is] *being* an induction heating coil of uneven diameter and turn density along the length thereof



for maintaining said temperature level and gradient over said free fall path.

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**Re. 31,474**
**TREATMENT OF ALLOYS**

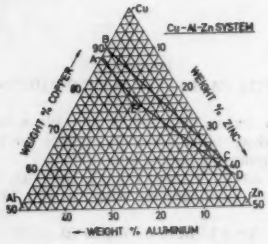
**Greville B. Brook, Beaconsfield, England, and Roger F. Iles, Foster City, Calif., assignors to Fulmer Research Institute Limited, Stoke Poges, England**

**Original No. 3,783,037, dated Jan. 1, 1974, Ser. No. 88,596, Nov. 12, 1970. Application for reissue Aug. 25, 1975, Ser. No. 607,553**

**Claims priority, application United Kingdom, Nov. 12, 1969, 55482/69; Nov. 14, 1969, 55969/69**

**Int. Cl.**[3] **C22F** *1/08, 1/14*

**U.S. Cl. 148—11.5 R** **34 Claims**




**1.** A method of making a heat-recoverable article, which method comprises cooling an alloy in a first shape from a first temperature to a lower temperature, said alloy comprising an intermetallic compound of copper which compound undergoes a shear transformation to a banded martensite *below the $A_f$ temperature* and which compound in the cooled condition has an anomalously low modulus of elasticity during loading, and then plastically deforming the alloy into a second shape at the lower temperature, the temperature and rate of cooling being such that on reheating the article at least partly resumes its first shape, *said alloy containing at least 50% by weight of copper in the form of an intermetallic compound and said martensite having pseudo-cubic symmetry.*

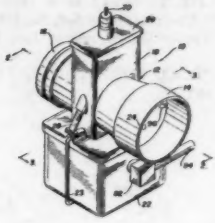
**Re. 31,475**
**CARBURETOR**

**William H. Edmonston, 14831 Dakota Rd., Apple Valley, Calif. 92307**

**Original No. 4,221,747, dated Sep. 9, 1980, Ser. No. 928,292, Jul. 26, 1978. Application for reissue Sep. 8, 1982, Ser. No. 416,089**

**Int. Cl.**[3] **F02M** *9/06*

**U.S. Cl. 261—44 B** **16 Claims**



*11. A carburetor, comprising:*

*a body having an inlet end, an outlet end, an intermediate slide supporting portion, and a throat extending therethrough from said inlet end to said outlet end;*

*an insert fixedly mounted within said slide supporting portion, said insert comprising an upper portion having an aperture therethrough that corresponds substantially in size and shape to the adjacent portions of said throat, the upper end of said upper insert portion being open and comprising an end face;*

*a fuel supply tube secured to the bottom of said upper insert portion and having an outlet at its upper end in communication with said insert aperture and said throat;*

*a throttle slide member movably mounted within said slide supporting portion for substantially transverse movement across said insert aperture and said throat to vary the open portion thereof, said throttle slide member being movable through said open upper end of said upper insert portion and being engageable with said end face of said open upper end of said upper insert portion to limit the transverse movement of said throttle slide member; and*

*a metering rod secured to said throttle slide member and extending downwardly into said fuel supply tube to control the flow of fuel therethrough.*

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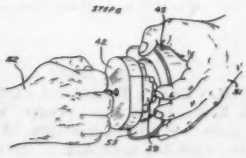
**Re. 31,476**
**CAST EJECTOR**

**Roger W. Mercer, 1340 Arlington Dr., Fairborn, Ohio 45324**

**Original No. 3,975,489, dated Aug. 17, 1976, Ser. No. 550,109, Feb. 13, 1975. Application for reissue Mar. 24, 1978, Ser. No. 889,993**

**Int. Cl.**[3] **B29C** *1/02, 5/00;* **A61C** *11/00, 13/00*

**U.S. Cl. 264—16** **3 Claims**



*2. The method of making a master dental cast and duplicating mold therefor comprising the steps of: (a) forming a negative impression of a patient's tooth and gum structure in a suitable impression material contained in a dental impression tray; (b)*

*pouring said negative impression with dental stone or the like to form a positive cast and allowing said stone to partially set; (c) temporarily affixing a plastic button on a flat slab, said button having a threaded recess facing said slab; (d) covering and surrounding said button on the slab with additional dental stone in the unhardened state; (e) inverting said tray and, with said positive cast centered on said threaded recess, joining the partially set dental stone of the positive cast with that on said slab to bond the two together; (f) allowing the dental stone to harden; (g) removing the joined positive cast and additional stone from said slab, and the tray and impression material from the positive cast, leaving a master dental cast having a flat surface with said plastic button embedded therein; (h) pouring a hydrocolloid or the like mold material about said master cast in a duplicating mold, leaving the flat surface of the master dental cast containing said button exposed, and allowing said mold material to set; (i) threading a handle into said button; and (j) holding said flask in one hand and the handle in the other, ejecting said master cast from the set mold material with a quick snap-like straight outward pull.*

*3. In a master dental cast made of dental stone or the like having on one side a replica of the tooth and gum structure of a patient and having the reverse side a flat surface, the improvement comprising a plastic button embedded in said stone and centrally located relative to said tooth and gum structure, said button having a threaded recess centrally located relative to the tooth and gum structure with the open end of said recess substantially flush with said flat surface, and means for locking said button in the stone.*

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Re. 31,477

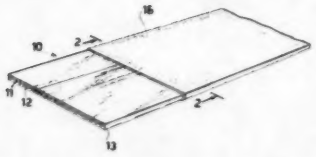
## FLAT MULTI-SIGNAL TRANSMISSION LINE CABLE WITH PLURAL INSULATION

**Joseph Marshall, Toyonaka, Japan, assignor to Thomas & Betts Corporation, Raritan, N.J.**

**Original No. 3,763,306, dated Oct. 2, 1973, Ser. No. 235,723, Mar. 17, 1972. Continuation-in-part of Ser. No. 163,199, Jul. 16, 1971, abandoned. Application for reissue Apr. 16, 1979, Ser. No. 17,491**

**Int. Cl.³ H01B *7/08***

**U.S. Cl. 174—115** **14 Claims**




1. A composite multi-signal transmission line cable for transmitting fast rise time electrical pulses with minimum far-end crosstalk comprising:

a flat multi-conductor cable including a plurality of generally parallel conductors embedded in a planar sheet of insulation material having a dielectric constant, *adjacent conductors being spaced apart at a predetermined pitch* with selected conductors adapted to be connected to ground, while remaining conductors are used as signal-carrying conductors *the ratio of the thickness of the insulation material to said pitch being at least 2.0 such that at least about 98 percent of the transverse electromagnetic (TEM) field propagates within said insulation material;* and

an insulator jacket surrounding the flat multi-conductor cable and in intimate contact with said insulation material; said insulator jacket being made of a dielectric material having a dielectric constant greater than the dielectric constant of said insulation material whereby the electrical effect of the composite of the insulation material and the insulator jacket is to establish a balance between the inductive and capacitive coupling coefficients between adjacent signal-carrying conductors thereby minimizing the far-end cross-talk.

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Re. 31,478

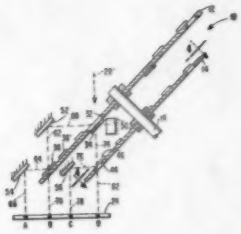
## ROTARY BEAM CHOPPER AND SCANNING SYSTEM

**Colin S. McArthur, and Douglas C. Clark, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.**

**Original No. 4,118,619, dated Oct. 3, 1978, Ser. No. 821,103, Aug. 2, 1977. Application for reissue Aug. 30, 1979, Ser. No. 71,334**

**Int. Cl.³ B23K *27/00***

**U.S. Cl. 219—121 LK** **25 Claims**



1. A rotary optical shutter and scanner for dividing a substantially continuous beam of light into a plurality of discrete light impulses and for repetitively scanning the impulses across a series of target areas, comprising:

a plurality of [coaxial] rotatable discs;

at least one annular shutter ring on each said disc *and at least two concentric annular shutter rings on at least one of said discs*, each shutter ring including at least one group of segments, said rings having corresponding, angularly aligned groups, the segments of each group being arranged in complementary coded sequences of reflective surfaces and through apertures to define multiple light paths between a light source and a target;

means for directing a substantially continuous beam of light toward at least one of said shutter rings for reflection from a reflective surface or passage through an aperture thereof and for subsequent direction toward a first target area or toward a second shutter ring for reflection from a reflective surface thereon or passage through an aperture thereof for direction toward a second target area; and

means for rotating said discs to move said segments of said annular rings into successive alignment with said beam of light whereby said beam is directed successively along said multiple light paths to each of said target areas, continued rotation causing said beam to repetitively traverse said target areas in a scanning motion.

# PLANT PATENTS

## GRANTED DECEMBER 27, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,164

### NEW ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Aug. 25, 1982, Ser. No. 411,357
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by heavily petaled, high centered yellow orange blooms with near white outer petals that quill to star-like points.

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5,165

### ROSE PLANT CV. KRICARLO

Michel Kriloff, Antibes, France, assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Aug. 20, 1982, Ser. No. 409,902
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—18 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, being particularly characterized in its long pointed buds that open slowly with a distinctively classical spiral form; its flowers are borne mostly one-to-a-stem on long strong stems which are suitable for cutting; its extremely long vase-life as a cut rose; its unique warm orange-pink coloration that holds well throughout the life of the flower; its extremely vigorous bush is easy-to-grow and produces a profusion of flowers nearly continually throughout the growing season, making a very attractive garden specimen; its consistently fine performance in a wide variety of climatic conditions; and its abundant deep green foliage attractively clothes the entire plant.

5,166

### CHRYSANTHEMUM PLANT

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jan. 18, 1982, Ser. No. 340,108
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct plant of *Chrysanthemum morifolium*, Ramat., known by the cultivar name of Mellow, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; dark yellow ray floret color; diameter across face of capitulum ranging from 70 to 90 mm. at maturity; uniform nine week flowering response; tall plant height when grown single stem; 15–20 cm. peduncles on open, normally terminal sprays, and slow development of tight green discs.

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5,167

### CHRYSANTHEMUM PLANT

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Mar. 10, 1982, Ser. No. 356,917
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—79 1 Claim

1. A new and distinct plant of *Chrysanthemum morifolium*, Ramat., known by the cultivar name of Rawhide, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; dark bronze ray floret color; diameter across face of capitulum ranging from 90 to 115 mm. at maturity; uniform ten week flowering response; tall plant height when grown single stem; 12.5 to 22.5 cm. peduncles; normally terminal sprays, and 13° C. minimum temperature tolerance for initiation and development of flowering buds.

# PATENTS

## GRANTED DEC. 27, 1983

### ERRATA

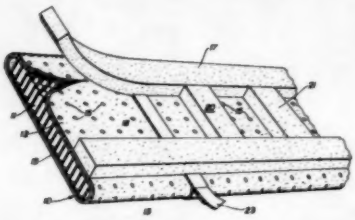
| For CLASS | See PATENT NO. |
|---|---|
| 383–039 | 4,422,672 |
| 502–025 | 4,422,954 |
| 502–169 | 4,422,955 |
| 502–158 | 4,422,956 |
| 502–177 | 4,422,957 |
| 502–217 | 4,422,958 |
| 502–247 | 4,422,959 |
| 502–206 | 4,422,960 |
| 502–301 | 4,422,961 |
| 339–176 | 4,423,288 |
| 381–071 | 4,423,289 |
| 381–051 | 4,423,290 |
| 381–043 | 4,423,291 |

# PATENTS

## GRANTED DECEMBER 27, 1983

## GENERAL AND MECHANICAL

**4,422,183**
**PROTECTIVE BODY SHIELD**
**Curtis L. Landi, and Susan L. Wilson, both of 257 San Carlos #5, Sausalito, Calif. 94965**
**Continuation-in-part of Ser. No. 47,233, Jun. 11, 1979, abandoned. This application Oct. 3, 1980, Ser. No. 193,630**
**Int. Cl.³ A41D** *13/00*
**U.S. Cl. 2—2** **7 Claims**



1. A protective shield comprising a core of lightweight, flexible, cellular, honeycomb construction having the axes and walls of the cells thereof perpendicular to the largest plane of said shield, flexible hinges formed by the intersection of one wall with another, and resilient, flexible, foam elastomer covering the open ends of said cells whereby said shield is highly flexible in its largest plane and is less flexible in planes perpendicular to said largest plane.

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**4,422,184**
**INSECT PROTECTIVE GARMENT**
**Noreen Myers, 3345 Sandyshore, Metamora, Mich. 48455**
**Continuation-in-part of Ser. No. 252,380, Apr. 9, 1981. This application Jun. 30, 1982, Ser. No. 393,670**
**Int. Cl.³ A42B** *3/00*; **A41D** *10/00*
**U.S. Cl. 2—4** **7 Claims**

1. An insect proof garment comprising:
an interconnected pair of arms and body portion, each formed of an insect excluding mesh, the body portion adapted to cover at least a portion of the wearer's body;
a hood formed of an insect excluding mesh joined to the body portion, the hood including:
a front aperture;
a visor joined to the hood at the upper end of the front aperture;
a cover member made of an insect excluding mesh joined at certain of its edges to the hood and covering the front aperture in the hood; and
weight means disposed along the bottom edge of the cover member for urging the cover member downward across the front aperture in the hood towards the body portion of the garment.

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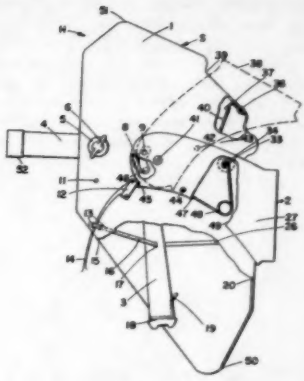
**4,422,185**
**WELDING HELMET**
**Reuben E. Cook, Box 600, Loup City, Nebr. 68853**
**Continuation-in-part of Ser. No. 836,516, Sep. 26, 1977, abandoned. This application Jun. 11, 1980, Ser. No. 158,368**
**Int. Cl.³ A61F** *9/06*
**U.S. Cl. 2—8** **28 Claims**



1. A welding helmet comprising a face protective hood having a concave rearward side for receiving an operator's face, means for attaching said hood to the upper portion of the head of said operator, said hood having a forward side having a viewing opening therethrough in a position for being in front of the eyes of said operator while said hood is fixed to the operator's head by said attaching means, a light-filtering module, said module having as at least one of its sections a transparent dark plate for disposition in a covering position for filtering light passing through said opening toward the rearward side of said helmet, means movably mounting said module on said hood so that said dark plate is at times in said covering position and at times in an uncovering position for uncovering at least a substantial portion of said viewing opening, a module controller inside of said concave rearward side of said hood, said module controller being operatively correlated with said module and being adapted to be engaged by the jaw of said operator so that by moving his jaw said operator can cause said module controller to move said module so as to move said dark plate between said covering and uncovering positions, said module controller comprising a chin strap assembly on the rearward side of said hood, said chin strap assembly having a lower chin-engageable portion below said viewing opening and extending generally horizontally from right to left, said chin strap assembly having right and left side portions extending upwardly from its said lower chin-engageable portion, visor-strap connecting means attaching at least one of said chin strap assembly side portions to said light-filtering module so that as said lower chin-engageable portion of said strap assembly is caused to move in one direction said module will move to cause said dark plate to uncover at least a substantial portion of said viewing opening, said module and said strap assembly defining a module and strap combination assembly, said module and strap assembly forming a module-strap component, said light-filtering module comprising a visor having a forward

portion and left and right rearwardly extending portions which latter are disposed alongside the left and right sides of said helmet respectively, pivot connection means attaching said right and left sides of said visor to said hood, said dark plate comprising a forward portion of said visor, when in a position for maximum uncovering of said viewing opening, said visor being disposed so that a substantial portion of said dark plate is upwardly of said viewing opening, said hood-to-head attaching means having a head-opening therein for receiving the head of an operator, said head opening having a head-engaging surface for engaging the head of the operator, said means for attaching said hood to the upper portion of the head of said operator comrising head band means defining a substantially horizontal band and right and left pivot attachment means attaching said head band means to said hood in a manner for the pivoting of said hood about said head band upwardly and downwardly about a horizontal axis so that the lower end of said hood can be swung upwardly until at least the majority of said hood is disposed above said pivot connection axis, a stop means for stopping said hood from pivoting downwardly about said axis beyond a position in which said viewing opening is lower than said head band and in a position for sight therethrough by said operator, said stop means having two cooperative parts, one part being mounted on said hood and one part on said head band.

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**4,422,186**

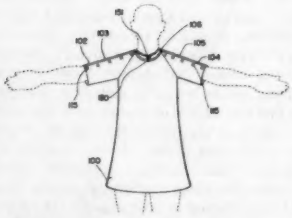
## HOSPITAL GARMENT

**Ann M. Loney, 2525 W. Washington, Las Vegas, Nev. 89106**

**Continuation of Ser. No. 215,675, Dec. 12, 1980, abandoned. This application Sep. 17, 1982, Ser. No. 419,641**

**Int. Cl.³ A41B *9/00***

**U.S. Cl. 2—114** **2 Claims**



1. A hospital garment comprising:

a gown for covering at least the shoulders and the upper arms of a patient, the gown being divided to form an opening extending from the patient's neck over the shoulders and along the arms so that access may be provided to the upper body of the patient without removing the gown;

a first plurality of pieces of opposing mating fabric material affixed to the gown on opposite sides at preselected intervals along the edges of the opening for fastening together and closing the edges of the gown; and

a first plurality of removable extension strips for coupling the edges of the opening of the gown in an open position, to permit the gown to be fastened when the edges of the opening cannot be brought together, each removable extension strip having a piece of opposing mating fabric material on opposite sides of each end for mating with the opposing mating fabric material affixed to the gown.

**4,422,187**

## SHANK FOR A JOINT ENDOPROSTHESIS

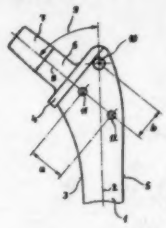
**Karl Zweymüller, Vienna, Austria, assignor to Sulzer Brothers Limited, Winterthur, Switzerland**

**Filed Dec. 30, 1980, Ser. No. 221,254**

**Claims priority, application Switzerland, Jan. 14, 1980, 256/80**

**Int. Cl.³ A61F *1/04***

**U.S. Cl. 3—1.913** **4 Claims**



1. A shank for a joint endoprosthesis, said shank having a blade widening from a distal end along a longitudinal median axis and a pin at a remote end extending along a pin axis intersecting with said median axis, said blade having three circular bores disposed therein in a triangular array, each said bore having a center designating a predetermined point with one of said points on said longitudinal axis and two of said other points on said pin axis, said points being disposed at predetermined measured distances from each other whereby after implanting a measurement of said points on subsequently taken x-ray photographs indicate changes in the reproduction scale of an x-ray photograph and changes in angular position of the photographing direction to said blade.

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**4,422,188**

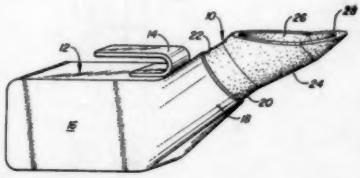
## MICTURITION ADAPTOR FOR CONVERSION OF A MALE BED URINAL TO FEMALE USE

**Bernice M. Strutton, 3344 St. James Pl., Antioch, Calif. 94509, and Robert R. Moore, 4010 East Ave., Hayward, Calif. 94542**

**Filed Oct. 13, 1981, Ser. No. 310,919**

**Int. Cl.³ A47K *11/00***

**U.S. Cl. 4—144.4** **7 Claims**



1. A micturition adaptor for converting to female use a conventional male bed urinal having a container portion and a neck portion with a circular orifice, the adaptor comprising: a molded member fabricated from a soft, flexible material of tubular configuration with a first orifice end of circular cross section constructed to connect to the neck portion of the male urinal and a second end having a substantially oblique cross-sectional orifice with an inwardly tipped deformable terminal lip, said second end being contoured for placement against the genital area of a female in a substantially sealing manner during micturition, wherein said tipped lip is pressed and deformed against the user's perineum while the user is in a prone position with her thighs comfortably spread said deformed lip reassum-

ing a slightly raised position as the urinal and said adaptor are removed from the pressed placement against the user's vaginal area to inhibit inadvertent runout or drip during withdrawal of the urinal and said adaptor.

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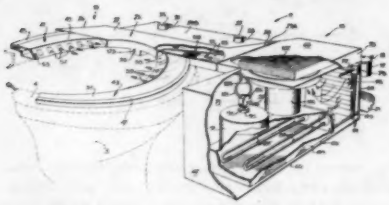
**4,422,189**

## TOILET SEAT SANITARY FIXTURE

**Guy Couvrette, 135, 19e Rue, Laval, Quebec, Canada H7N 1E7**

**Filed Nov. 17, 1981, Ser. No. 322,323**
**Int. Cl.³ A47K *4/00***
**U.S. Cl. 4—420.2** **9 Claims**



1. A bidet for use in combination with a standard toilet including a toilet bowl and a toilet seat located in a toilet room, said bidet comprising:

(A) a thin oval-shaped element fixed to the toilet bowl between the upper periphery of the toilet bowl and the toilet seat, said thin element comprising:

(a) means for fixing it to the toilet bowl;

(b) an air duct extending along the whole length of the element;

(c) a plurality of air vents symetrically arranged with respect to the longitudinal axis of the toilet bowl which extend between the air duct and the closed space defined by the upper periphery of the toilet bowl;

(d) a first water conduct connected to a first nozzle located in the middle of the rear part of the thin element for spraying water toward the center of the closed space defined by the upper periphery of the toilet bowl;

(e) means for orientating and adjusting the pressure of the first nozzle spray;

(f) a second water conduct connected to a second nozzle located in the middle of the front part of the toilet bowl for spraying water toward the center of the closed space defined by the upper periphery of the toilet bowl; and

(B) a small casing having an upper wall rigidly fixed to the rear of the thin element and extending in a direction parallel to the longitudinal axis of the toilet bowl without overheighting the plane in which extends the toilet seat, said casing comprising:

(a) a water supply conduct connected to a supply of cold water under pressure, external to the casing;

(b) a first valve controlled from the outside of the casing for opening or closing the water supply conduct;

(c) a water tank provided with an inlet connected to the water supply conduct, and an outlet;

(d) electrical heating means adjustable from the outside of the casing for heating water inside the tank;

(e) distribution means connecting the outlet of the tank to the first and second water conducts of the thin element said distribution means including a second valve controlled from the outside of the casing for directing the water contained in the tank either to the first nozzle via the first conduct or to the second nozzle via the second conduct or to both nozzles via both conducts;

(f) a reversible fan controlled from the outside of the casing and connected to the air duct extending along the thin element for drawing or blowing air through the air vents of said thin element;

(g) a first clack-valve allowing entry of ambient air inside the casing in order to supply the fan when this fan is blowing;

(h) a second clack-valve allowing exit of the air drawn by the fan when the fan is drawing, toward an exhaust external to the casing and connected to the outside of the toilet room; and

(i) electrical heating means controlled from the outside of the casing for heating the ambient air drawn by the fan and blown through the air vents of the thin element.

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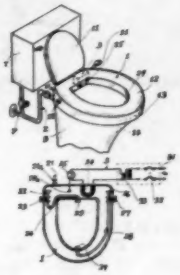
**4,422,190**

## SAFETY TOILET SEAT

**Chuan-Chih Huang, 10-4 Fl., No. 62, Chang Chun Rd., Taipei, Taiwan**

**Filed Jun. 1, 1982, Ser. No. 383,996**
**Int. Cl.³ A47K *4/00, 3/20***
**U.S. Cl. 4—420.3** **6 Claims**



1. A safety toilet seat comprising:

a cassette jacket-type seat which is composed of a toilet seat cover, a top plate, a side plate and a bottom plate, said top plate, and said side plate and said bottom plate being fixed to form an integrated closed water jacket to correspond to the top edge of a toilet bowl;

a water transporting system connected to a source of water under pressure and the inlet of the associated water closet tank, conduit means intermediate said water transporting system and said jacket, whereby water is diverted from said water transporting system to said jacket, and

an electric heating control system provided to heat the water within said jacket to provide heated water for washing the genital area of a user and a heated seat surface for sitting.

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**4,422,191**

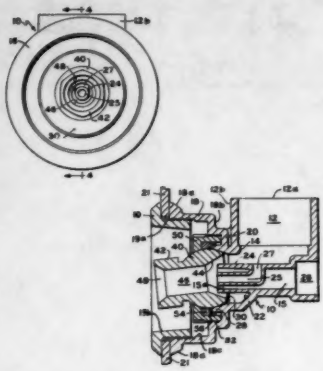
## HYDROTHERAPY JET FOR TUBS, SPAS OR POOLS

**William R. Jaworski, Minneapolis, Minn., assignor to Jope Manufacturing Company Inc., Minneapolis, Minn.**

**Filed Sep. 29, 1982, Ser. No. 427,847**
**Int. Cl.³ A04H *3/18;* A61H *33/02;* E03C *1/02***
**U.S. Cl. 4—496** **14 Claims**

1. A hydrotherapy jet comprising a housing, a movable nozzle having a passage therethrough with a fluid inlet and a fluid outlet at opposite ends of the passage, the movable nozzle being supported in the housing for movement about a center point to enable the outlet to be pointed in different directions, means at the inlet end of the nozzle defining a central water stream aligned axially with the passage in the nozzle and flowing toward it, means at the inlet end of the nozzle defining an outer annular water stream also flowing toward the inlet in the nozzle, an annular air stream located between the water streams and being spaced outwardly from the axis of the passage in the nozzle whereby the impact of the two water

streams vigorously striking one another enhances the entrainment of air from the intermediate lamina of air located between



them to form a combined stream of water and air flowing out of said nozzle.

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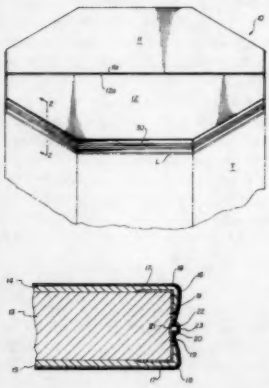
**4,422,192**

## SPA OR HOT TUB COVER

**Terry Jacobs, P.O. Box 478, Cedar Ridge, Calif. 95924**

**Filed Nov. 24, 1982, Ser. No. 444,316**
**Int. Cl.³ E04H *3/16, 3/18***
**U.S. Cl. 4—498** **5 Claims**



**1.** An insulative spa or hot tub cover comprising, in combination, at least one, substantially flat, inner, insulative foam core surrounded on a peripheral edge by a continuous, inwardly disposed, C-shaped support channel, a relatively softer foam layer applied to the upper and lower surfaces of said foam core and tucked over the edges of said foam core,

a seam sealed, film, vapor barrier envelope completely enclosing said foam core, said channel, and said insulative foam layer,

an overlapping outer vinyl cover layer,

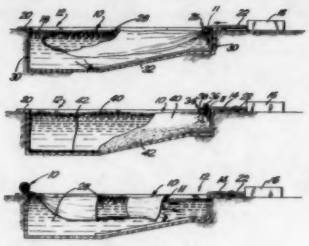
and a trim strip directly overlying said overlap of said outer cover along the peripheral edge of said inner core, riveted to said channel by rivet means.

**4,422,193**

## PARTITIONING DEVICE AND METHOD FOR POOLS

**Richard E. Kravath, 6 Scott St., Dobbs Ferry, N.Y. 10522**

**Filed Apr. 5, 1982, Ser. No. 365,177**
**Int. Cl.³ E04H *3/19, 3/18***
**U.S. Cl. 4—505** **6 Claims**



**1.** A swimming pool partitioning device for efficient treatment and storage of water in a swimming pool, said partitioning device for use with a swimming pool having a water pumping and treating system comprising a water treatment device for filtering and chemically treating the water, an egress conduit in communication with the water in the swimming pool and with the water treatment device for accommodating the flow of water from the pool to the water treatment device, an ingress conduit in communication with said water treatment device for accommodating the flow of treated water from said water treatment device, and a pump for urging the flow of water from the swimming pool, through the egress conduit, the water treatment device and the ingress conduit, said swimming pool partitioning device comprising:

a water tight, flexible container means having at least one opening and having a size and shape enabling said container means to substantially occupy the swimming pool, said container means being unattached to said pool to enable removal of said container means from the pool when the container means is empty; and

a coupling means for releasably securing the opening of said container means to said ingress conduit of said pumping and treatment system, whereby water from said swimming pool treated by the water treatment device of said pumping and treating system is urged through said ingress conduit and into said partitioning device thereby separating the water in said swimming pool that has passed through the pumping and treating system from the water in said swimming pool that has not passed through the pumping and treating system.

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**4,422,194**

## FLUID FILLED BODY SUPPORTING DEVICE

**Gundar E. Viesturs, and Eric A. Viesturs, both of Southbury, Conn., assignors to Connecticut Artcraft Corp., Naugatuck, Conn.**

**Filed Aug. 24, 1981, Ser. No. 295,504**
**Int. Cl.³ A47C *27/08;* A61G *7/04***
**U.S. Cl. 5—451** **5 Claims**

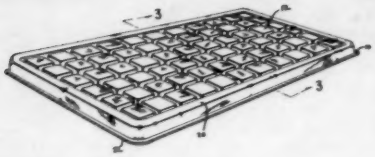
**1.** A body supporting device comprising:

a first plastic section having oppositely disposed inner and outer surfaces, the outer surface being disposed above the inner surface and permanently defining a plurality of closely spaced raised regions of like size and contour which are interconnected by channels disposed below the regions, the inner surface permanently defining a like plurality of deep recesses, each deep recess constituting the inside of a corresponding region, said deep recesses being interconnected by shallow recesses, each shallow recess constituting the inside of a corresponding channel;

a second plastic section sealed to the inner surface of the first

section in a manner in which said deep and shallow recesses communicate with each other; and

a flexible hollow tube disposed around the periphery of said sections and secured thereto, said tube having a wall with




openings which connect the tube interior to said shallow recesses, said tube and sections being sealed to each other to prevent air and water leakage between the interior of the tube and sections and the outside thereof.

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**4,422,195**

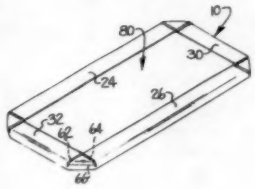
## FITTED BED SHEET AND METHOD OF MANUFACTURE

**Joseph L. Russo, and Richard Sonder, both of New York, N.Y., assignors to Simmons Universal Corporation, New York, N.Y.**

**Filed Oct. 13, 1981, Ser. No. 310,454**

**Int. Cl.³ A47G *9/02***

**U.S. Cl. 5—497** **13 Claims**




1. A fitted bed sheet for use in association with an octagonal mattress, said fitted sheet comprising an octagonal panel whose perimeter defines a pair of opposed sides, a pair of opposed ends and four corners each corner joining a side to an adjacent end each of said opposed sides being at least twice as long as each of said opposed ends, and a continuous panel integrally joined to said octagonal panel along a juncture comprised of fold lines running the entire perimeter of said octagonal panel.

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**4,422,196**

## METHOD OF FORMING A TORQUE NUT

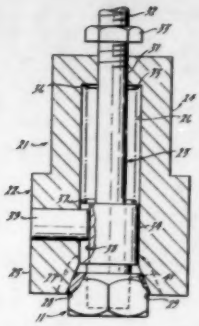
**James H. Skinner, Birmingham, Mich., assignor to Federal Screw Works, Detroit, Mich.**

**Filed Jan. 16, 1981, Ser. No. 225,800**

**Int. Cl.³ B21D *53/24;* B21K *1/70***

**U.S. Cl. 10—86 A** **7 Claims**

1. The method of forming a female thread torque fastener comprising the steps of forming a contiguous, uninterrupted female thread in a member defining a threaded hole therein, inserting a mandrel into said threaded hole of said member, said mandrel having at least one recess portion and portions adjacent said recess portion for contacting the crest of said thread in said member to internally support said thread, and deforming at least one localized portion of said thread radially inwardly into said recess portion of said mandrel, while simultaneously substantially precluding deformation of said thread



adjacent said locally deformed portion by internally supporting said thread by said adjacent portions of said mandrel.

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**4,422,197**

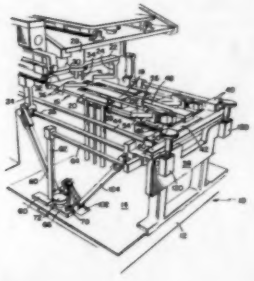
## WORKPIECE TRANSPORTING MECHANISM

**Frederick L. Christenbery, Derry, N.H., assignor to International Shoe Machine Corporation, Nashua, N.H.**

**Filed May 5, 1982, Ser. No. 375,508**

**Int. Cl.³ A43D *21/00***

**U.S. Cl. 12—1 A** **3 Claims**



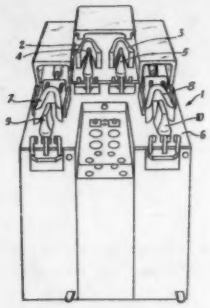
1. A mechanism for so transporting a workpiece rearwardly to a work station that a prescribed portion of the workpiece is in registry with a prescribed portion of the work station comprising: a carrier; a front gauge mounted to the carrier for forward-rearward movement; a back gauge, located rearwardly of the front gauge, mounted for forward-rearward movement; a work support mounted to the front gauge and extending rearwardly towards the back gauge; gauge moving means for moving the front gauge rearwardly with respect to the carrier and the back gauge forwardly at different speeds until the gauges intersect the opposite ends of the workpiece that is on the work support; means, operative after the intersection of the gauges with the opposite ends of the workpiece, to lock the front gauge to the carrier and to hold the workpiece on the work support; and means for thereafter transporting the carrier rearwardly a prescribed distance to thereby transport the workpiece to the work station with said prescribed portions in registry; characterized in that said gauge moving means comprises: adjusting means for adjusting the ratios at which the gauge moving means moves the front gauge rearwardly and the back gauge forwardly.

4,422,198

## MACHINES FOR BENDING FOOTWEAR COUNTERS

Lucien Bichet, Draveil, France, assignor to Anver, Maisons Alfort, France

Filed Apr. 12, 1982, Ser. No. 367,353
Claims priority, application France, May 5, 1981, 81 08843
Int. Cl.³ A43D 11/00
U.S. Cl. 12—54.3 3 Claims



1. Machine for bending long footwear counters comprising a first automatically operating double shaper/punch located on a frame at a first station, said shaper/punch being adapted for hot reactivation of the thermogluable material constituting the counter of the footwear, a second double shaper/punch located at a second station, for stabilizing the counter while at a refrigerated temperature, said machine being characterized in that it includes at two double stations a very long punch or last bent to the shape of the counter and further that the shaper, at said second station is formed from a single piece of plastic and exhibits in its last edge a hardness clearly greater than that exhibited at the upper part of the shaper.

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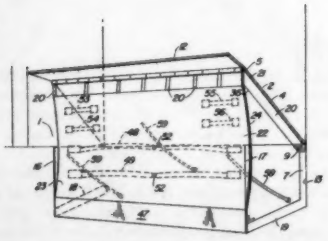
4,422,199

## DOCKBOARD SEAL

Sylvan J. Frommelt, Peosta, Iowa, assignor to Frommelt Industries, Inc., Dubuque, Iowa

Filed Oct. 9, 1981, Ser. No. 310,328
Int. Cl.³ E01D 1/00
U.S. Cl. 14—71.1 12 Claims



9. In an adjustable dockboard for spanning the gap between a loading dock and the bed of a carrier in loading or unloading position in front of the dock, the dockboard embodying a stationary mounting structure, a ramp having front and rear portions, with the rear portion hingedly connected to said mounting structure so that the ramp can swing up and down around a horizontal axis between a raised position wherein it is disposed at a forwardly opening acute angle to the horizontal above the floor of the loading dock and a lowered position wherein it is disposed in horizontally extending position wherein it is substantially flush with said floor of said loading dock, and said mounting structure including a depression in said loading dock, said depression embodying two oppositely disposed side walls, between which said ramp is disposed when it is disposed in said lowered position, a rear wall and an open front, and wherein the bottom of said ramp comprises a plurality of elongated beams extending between the front and rear edges thereof in substantially parallel spaced relation to each other, the combination of

a. means disposed between said beams at said front portion of said ramp for closing the spaces therebetween,

b. a flexible sheet member having

(1) a top,

(2) a bottom, and

(3) two oppositely disposed side portions,

c. means securing said top of said sheet member to the bottom of said beams across substantially the full width of said front portion of said ramp,

d. means securing said bottom of said sheet member to the bottom of said depression across substantially the full width of said depression between said side walls thereof,

e. said sheet member being movable upwardly and downwardly by said ramp between said raised and lowered positions of the latter, and

f. elongated resilient members extending laterally across one face of said sheet member in position to hold said side portions of said sheet member in wiping engagement with respective ones of said sides of said depression in all positions of said sheet member.

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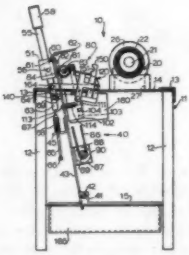
4,422,200

## TEXTILE SPINDLE CLEANING APPARATUS

William M. Atwater, 114 E. Salisbury St., Pittsboro, N.C. 27312

Filed Sep. 16, 1982, Ser. No. 419,049
Int. Cl.³ A46B 13/02
U.S. Cl. 15—21 D 8 Claims



1. An apparatus for cleaning dried glue, cot debris, and the like, from the cot-mounting shaft portions extending outwardly from the bearing portion of a textile spinning roller spindle from which the cots have been stripped, comprising:

(a) a frame;

(b) powered brush structure mounted and rotatable about a fixed axis on said frame and having cleaning brush surfaces adapted when engaged with the cot mounting end shaft surfaces of a cot stripped spindle to clean such surfaces of glue, cot particles, and the like;

(c) spindle support structure mounted for tilting about a fixed axis on said frame parallel to said brush structure axis rearwardly to a spindle loading position, forwardly to a spindle cleaning position and therebetween to a discharge position at which the cleaned spindle is ejected, said spindle support structure including and having mounted thereon:

(i) holder means positionable for receiving and releasably locking the central bearing portion of a cot stripped spindle to be cleaned enabling the same to rotate about an axis parallel to the axis of rotation of said brush structure when the outer cot supporting shaft ends of

said spindle are engaged with and being cleaned by said brush surfaces in said cleaning position;

(ii) drive means adapted to drive said stripped spindle being cleaned during the cleaning of said outer shaft ends and at a speed different from the speed at which said brushes are driven; and

(iii) an operator handle and associated linkage interconnected with said holder means and being adapted in said loading position to present said holder means for receiving a cot stripped spindle to be cleaned, to thereafter be moved to a locking position wherein said central bearing portion of said stripped spindle being cleaned is releasably locked in said axially parallel position and said drive means is engaged to drive said stripped spindle being cleaned, to then move the rotating said stripped spindle to be cleaned to said cleaning position to engage the outer shaft ends thereof with said brush surfaces for cleaning and after said cleaning to eject the cleaned spindle and restore said holder means to said loading position and with said drive means in a disengaged position.

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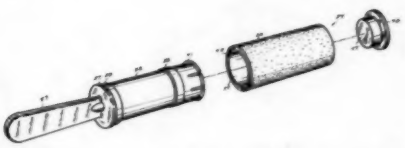
**4,422,201**

## LINT REMOVER

**Nicholas D. McKay, Grand Blanc, Mich., assignor to Helmac Products Corporation, Flint, Mich.**

**Filed Aug. 6, 1981, Ser. No. 290,785**
**Int. Cl.³ A47L 25/00**
**U.S. Cl. 15—104 A** **9 Claims**



6. In a lint remover assembly, the combination comprising:

a unitary integrally formed adhesive tape roll sleeve-engaging hollow support cylinder having an open outer end, said hollow support cylinder provided with a plurality of resiliently mounted radially extending adhesive tape roll sleeve-engaging flange elements provided along the outer peripheral edge of said open outer end of said hollow support cylinder, said hollow support cylinder having an integral elongate handle portion extending axially outwardly from one end thereof, said hollow support cylinder provided with an adhesive tape roll sleeve-engaging annular stop flange at the handle end of said hollow support cylinder, said annular stop flange being in axially aligned spaced-apart register with said sleeve-engaging flange elements, said annular stop flange and said sleeve-engaging flange elements cooperating to selectively slidably retain an adhesive tape roll sleeve assembly mounted therebetween against relative axial movement on said hollow support cylinder while permitting selective rotative movement of the adhesive tape roll sleeve assembly on said hollow support cylinder; and

a closure plug provided for selective frictional engagement with said open outer end of said hollow support cylinder, said closure plug cooperating with said hollow support cylinder so as to define a storage compartment therein.

**4,422,202**

## INVERTIBLE FLOOR BROOM

**William A. Malvasio, 608 S. Browns Lake Dr., Burlington, Wis. 53105**

**Filed Mar. 18, 1982, Ser. No. 359,299**
**Int. Cl.³ A46B 9/00**
**U.S. Cl. 15—106** **5 Claims**

1. A floor broom, comprising an elongate member, and an elongate handle releasably connected to said member on either diametrically opposite face of said member to extend perpendicular to the length of said member and with the length of said handle extending along a plane extending on the length of and through said member and defining two opposite sides of said member, a first group of flexible bristles attached to said member and extending along the length thereof throughout one of said two opposite sides of said member and being of a uniform stiffness, a second group of flexible bristles attached to said member and extending along the length thereof throughout the other of said two opposite sides of said member and being of a stiffness less than said uniform stiffness, all of said bristles terminate in their extent from said member in the formation of a full cylinder of 360 degrees of angulation of said bristles, all for alternating selective sweeping use of either group of said bristles, and all for selection of any one of the four quadrants of the 360 degrees being presentable closest to the floor to be swept and when said handle is at 45 degrees to the horizontal.

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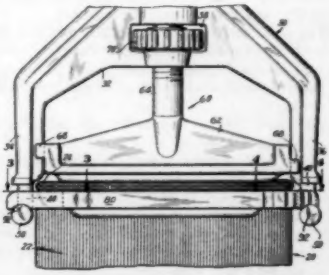
**4,422,203**

## PLASTIC MOP HOLDER

**Franz R. Zenker, Johnstown, N.Y., assignor to White Mop Wringer Company, Fultonville, N.Y.**

**Filed Jul. 9, 1982, Ser. No. 396,599**
**Int. Cl.³ A47L 13/258**
**U.S. Cl. 15—150** **5 Claims**



1. A plastic holder for a mop head comprising:

a first yoke having a base and two laterally spaced, substantially parallel longitudinal arms, each arm having a free end portion and a mounted end portion, the mounted end portions of the arms being connected together by the base, and the free end portion of each arm including a longitudi-

nally extending post terminating at the free end of the arm in a retention member extending transversely to the yoke plane defined by the longitudinal axes of the arms;

a mop head support member pivotally mounted on the yoke so as to extend between the posts, one end portion of the support member defining an aperture through which the adjacent post passes, the other end portion of the support member defining a second yoke between the arms of which the adjacent post passes, parts of the end portions of the support member contacting the retention members to prevent the support member from slipping off the free ends of the arms of the first yoke when the posts are respectively disposed in the aperture and between the arms of the second yoke, the aperture and associated post cooperating to allow the support member to be moved longitudinally in the yoke plane to retract the second yoke from the associated post and to thereafter allow the support member to be pivoted at least 180° about the post passing through the aperture; and

means mounted on the yoke for releasably clamping a mop head against the support member.

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**4,422,204**

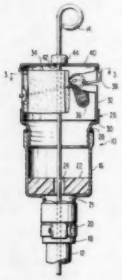
## APPARATUS FOR CLEANING A DIPSTICK

**Arvin Long, Jr., 4334 Rock Creek Rd., Alexandria, Va. 22306**

**Filed Jul. 29, 1982, Ser. No. 403,000**

**Int. Cl.³ F01M *11/12***

**U.S. Cl. 15—210 B** **7 Claims**



1. Apparatus for cleaning a dipstick, said apparatus comprising:

(a) a cup-shaped member adapted to be mounted over the dipstick receiving orifice of a crankcase, said cup-shaped member having an opening in the bottom thereof positioned to act as a continuation of the dipstick receiving orifice and sized to pass the dipstick;

(b) an absorbent member removably placed in the bottom of said cup-shaped member, said absorbent member having an opening therethrough sized and positioned to closely receive the dipstick but to allow the dipstick to pass therethrough;

(c) a hollow cylindrical member releasably mounted on said cup-shaped member so that the interior of said hollow cylindrical member constitutes a continuation of the interior of said cup-shaped member;

(d) a pair of wiper lips fabricated from an absorbent material mounted in said hollow cylindrical member;

(e) first means for biasing said wiper lips towards a position in which the dipstick can be passed therebetween without contacting said wiper lips;

(f) second means for moving said wiper lips against the bias of said first means into a position in which they will contact and wipe the dipstick as it is passed therebetween; and

(g) a cap mounted over the top opening of said hollow cylindrical member, said cap having an opening therein sized and positioned to permit the dipstick to pass through while the portion of said cap surrounding the opening acts as an abutment surface for the dipstick stop.

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**4,422,205**

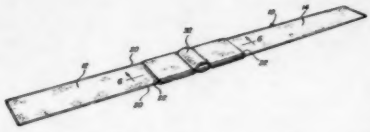
## BATHING APPLIANCE

**Lorenzo C. Braxter, Sr., 502 First Ave., Selma, Ala. 36701**

**Continuation-in-part of Ser. No. 943,703, Oct. 10, 1978, abandoned. This application Jan. 19, 1982, Ser. No. 340,831**

**Int. Cl.³ A47K *7/03***

**U.S. Cl. 15—222** **9 Claims**



1. A bathing appliance for washing and scrubbing the user's back and enabling thorough cleansing of the central depressed vertically extending area of the back registered with the user's spinal column, said appliance including an elongated flexible strip having at least one side thereof defining a rough scrubbing surface, said one side including a transversely extending, convexly rounded hump centrally intermediate its opposite ends, said strip including a pair of thin opposite side panels of flexible material and a central thicker panel of resilient material sandwiched between said opposite side panels.

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**4,422,206**

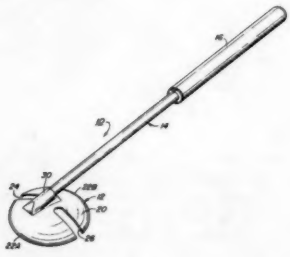
## ICE SCRAPER

**Arthur W. Brace, 48 N. Lincoln, Lombard, Ill. 60148, and James M. Chmielewski, 8 Waynewood Dr., West Chicago, Ill. 60185**

**Filed Jun. 18, 1982, Ser. No. 389,609**

**Int. Cl.³ B60S *1/04***

**U.S. Cl. 15—236 R** **5 Claims**



1. A scraping tool comprising

a dished member formed of plastic and having first and second arcuate scraper edges lying in a common plane,

said member having first and second aligned radial slots separating the rim of said dished member into said two scraper edges.

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**4,422,207**

## PLASTIC WIPER BLADE

**Giuseppe A. Maiocco, Rivoli, and Sergio Vidoni, Torini, both of Italy, assignors to Champion Spark Plug Italiana S.p.A., Druento, Italy**

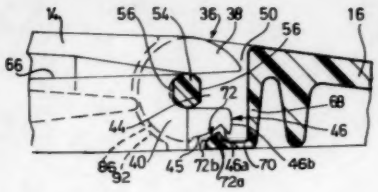
**Filed Jul. 8, 1982, Ser. No. 396,262**

**Int. Cl.³ B60S *1/38***

**U.S. Cl. 15—250.42** **7 Claims**

1. A plastic wiper blade comprising a main bridge and two secondary yokes, pivotally linked to the end portions of the main bridge, each of said secondary yokes being provided with

an aperture wherein extends a transverse pivot and the main bridge being provided at each of its two end portions with a fork, the limbs of which extend substantially in the prolongation of the main bridge and define a seat for said transverse




pivot of each secondary yoke, characterized in that the forks and the secondary yokes are each provided with cooperating first and second stop means spaced from said transverse pivots and capable of preventing the withdrawal of the transverse pivots from their respective seats.

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**4,422,208**

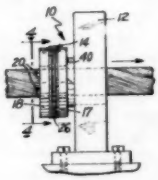
## WIRE ROPE CLEANING TOOL

**Galen V. Rohrbaugh, Rte. 3, Box 98, Oakland, Md. 21550**

**Continuation of Ser. No. 288,017, Jul. 29, 1981, abandoned. This application Dec. 1, 1982, Ser. No. 445,822**

**Int. Cl.³ B08B** *1/02, 1/04, 11/00*

**U.S. Cl. 15—256.6** **5 Claims**




1. A wire rope cleaning tool combined with a bumper stop means having a U-shaped guide for the rope to be cleaned and an anti-friction thrust washer located between said U-shaped guide and the wire rope cleaning tool, said tool comprising:

a pair of apertured side plates in the shape of a washer, one for the right hand and the other for the left hand side of the rope, the rope passing through the circular aperture of said plates,

a plurality of pie-shaped segments each of which is secured to the plates by two bolt means, one bolt means in each segment provided for one of said pair of plates and the other bolt means for the other of said pair of plates, said plurality of segments providing alternating spaces between adjacent segments for inserting and holding there between a hardened plastic scraping bit there being one scraping bit for each helical junction in a cross-section of the rope,

a plurality of scraping bits, each scraping bit consisting of a rectangular body of hardened plastic formed with rectangular sides and at its bottom with a V-shaped arcuate scraping surface and a sharp edge at the vertex of the V which fits into a helical junction of the rope to scrape the junction free from dirt and grease with each scraping bit being formed at its top with a channel adapted to hold a circular tension spring within the channel after the plurality of bits are mounted in circular array with the rectangular sides held between the alternating spaces between said plates,

a circular tension spring which fits over the top of the plurality of segments mounted between said plates and into the channel portion within the sides of the channel portion of each of the bits, said tension spring urging the bits into radial pressing engagement with the rope for scraping the helical junctions of the rope, and

a closing and opening clamp which is fitted between the ends of said circular tension spring and is adapted to expand and open the spring when said clamp is opened and adapted to tension and tighten the spring when said clamp is closed to force the V-edge of the bits into the helical junctions of the rope for scraping away dirt and grease.

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**4,422,209**

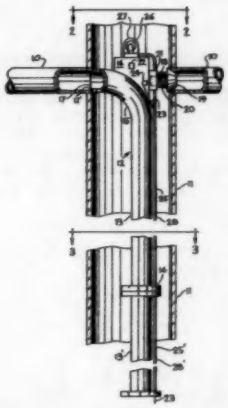
## MANIFOLD TOOL GUIDE

**Aleksandar Djordjevic, Thousand Oaks, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Jul. 8, 1982, Ser. No. 396,191**

**Int. Cl.³ B08B** *9/04*

**U.S. Cl. 15—257 R** **13 Claims**



1. A tool guide for use in the inspection and cleaning of pipes of a manifold system comprising: a guide tube defining an axis and having an angled end section; and a locking device mounted on said guide tube for retaining the end of said end section of said guide tube in contact with a pipe to be cleaned; said locking device including a plurality of adjustable leg members extending outwardly from said axis, a spring-loaded slide member extending outwardly from said axis, and means for moving said slide member.

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**4,422,210**

## INSTALLATION FOR INTERNAL CLEANING OF TUBES

**Arne Bergsand, Floda, and Henryk Marsland, Västra Frölunda, both of Sweden, assignors to Göteborgs Maskinkonsult Aktiebolag, Gothenburg, Sweden**

**Filed Nov. 12, 1981, Ser. No. 320,719**

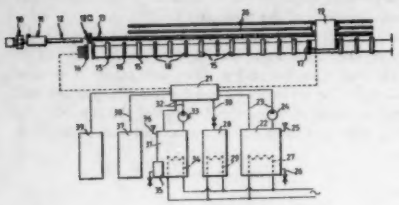
**Claims priority, application Sweden, Nov. 12, 1980, 8007923**

**Int. Cl.³ A47L** *5/38*

**U.S. Cl. 15—302** **9 Claims**

1. An installation for internal cleaning of tubes, said tubes having a front end and a rear end, the installation comprising a first means for connecting a first fluid conduit to one end of said tubes; a second means for connecting a second fluid conduit to the other end of said tubes; containers for two different fluid cleaning agents; a steam source; and means for connecting respectively said containers and said steam source with said fluid conduits for causing fluid flow through said conduits

according to a pre-determined sequence in order to first flush through the tubes one of the fluid cleaning agents, then subject-



ing the tubes to a period of clean blowing with steam, and then to flush through the tubes the other fluid cleaning agent.

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4,422,211

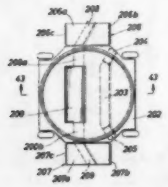
## VACUUM CLEANER ATTACHMENT FOR ROTARY LAWNMOWERS

Allen A. Chernosky, 4015 Turnberry, Houston, Tex. 77025

Division of Ser. No. 293,593, Aug. 17, 1981, which is a continuation-in-part of Ser. No. 3,284, Jan. 15, 1979, Pat. No. 4,306,331, which is a continuation-in-part of Ser. No. 680,486, Apr. 26, 1976, abandoned, which is a division of Ser. No. 499,830, Aug. 23, 1974, Pat. No. 3,995,348. This application Nov. 18, 1982, Ser. No. 442,562

Int. Cl.³ A47L 9/00

U.S. Cl. 15—328 5 Claims



1. A removable attachment for converting a rotary mower to a vacuum cleaner for picking up debris on sidewalks, driveways, and the like, where the mower has a propeller-type grass-cutting blade rotating in a housing having a discharge port and an opening in the bottom thereof through which grass normally extends to be cut by the rotating blade, said attachment comprising a baffle member extending across the opening in the housing and having an opening therein smaller than the opening in the housing, said baffle member including a flap member attached to the baffle member and extending under the opening, said flap member being inclined downwardly to provide an inclined surface up which debris can be moved into the opening by air pulled through the opening by the rotating blade of the mower, means attaching the flap member to the baffle member for pivotal movement around a horizontal axis to allow the flap member to pivot toward and away from the baffle member as required by the surface over which the mower is moving, an air flow controlling means positioned below the baffle member to direct air toward the opening and the inclined surface of the flap member, and means for releasably attaching the baffle member to the housing to restrict the flow of air between the member and the housing sufficiently to cause most of the air pulled into the housing by the blade to flow through the opening.

4,422,212

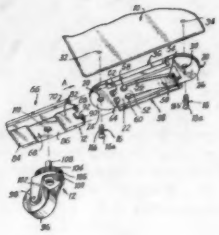
## NON-READILY DETACHABLE LUGGAGE SUPPORT UNIT

Julius Sheiman, and Samuel Sheiman, both of 247 Centre St., Crest Lock Co., Inc., New York, N.Y. 10013

Filed Jul. 7, 1981, Ser. No. 281,074

Int. Cl.³ B60B 33/00

U.S. Cl. 16—29 10 Claims



1. A detachable ground-engaging accessory unit for supporting luggage to be moved from place to place, comprising:

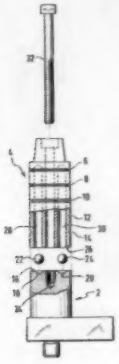
(a) a stationary base member adapted to be secured to the luggage, said base member having an elongated substantially planar base wall and a pair of side rails each extending at least partially along opposite respective longitudinal side edges of the base wall, said base member also having an elongated cantilever leaf spring which includes one spring end connected to the base wall, an opposite free spring end acting as a locking bolt, and a resilient offset spring portion intermediate the spring ends and having a normal position lying out of the plane of the base wall; and

(b) a movable slide member having an elongated main body for operatively engaging the ground on which the luggage is to be supported, and a pair of side tracks each extending at least partially along opposite respective longitudinal side edges of the main body, said side tracks slidably engaging the side rails for mounting the slide member on the base member for guided sliding movement between a disassembled and an assembled condition, said slide member having a leading detent portion for cammingly engaging and thereby urging the offset spring portion during said sliding movement towards the base wall until the leading detent portion of the slide member is slid past the locking bolt end of the spring, whereupon the spring due to its inherent resilience engages behind the detent portion with snap-type action to thereby secure the slide member and the base member in said assembled condition, said slide member also having in the vicinity of the leading detent portion an access opening which extends through the slide member to expose the spring locking bolt located therebelow in the assembled condition, said access opening being dimensioned to receive therethrough a disassembly tool operative for displacing the offset spring portion back towards the base wall until the free spring end locking bolt clears the detent portion, whereby the slide member is quickly and easily removed from the base member, said leading detent portion in the assembled condition covering and extending beyond the periphery of the offset spring portion and the free spring locking bolt, except at the access opening, to thereby prevent external forces other than from the tool from displacing the offset spring portion and effecting the disassembled condition, whereby the slide member is not readily detachable from the base member during transport of the object.

## 4,422,213
## DOOR CLOSER SHAFT

Mario Marinoni, Magenta, Italy, assignor to Casma di Vi Marinoni & Figli, Maggio, Italy

Filed Aug. 4, 1981, Ser. No. 289,905
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1980, 3033363
Int. Cl.³ E05F 3/00
U.S. Cl. 16—71 6 Claims



1. An axially extending closer shaft for a door closer comprises a first axially extending section arranged to be mounted in a door closer housing where it is under the influence of a closing spring and a damper, and a second axially extending section in alignment with said first section and connected to said first section, said second section arranged to be located outside the door closer housing and to be connected to a door, wherein the improvement comprises that said second section has a plurality of annular grooves extending around the axis thereof with said grooves spaced apart in the axial direction of the closer shaft, said first section has an end surface extending transversely of the axis of the closer shaft adjacent to the second section and said end surface having at least two recesses formed therein, a coupling ball located in each of said recesses, and said second section has an axially extending bore extending from the end surface of said second section adjacent the end surface of said first section and aligned with each one of said recesses in said first section so that said balls seat within said bores for providing a coupling between said first and second sections.

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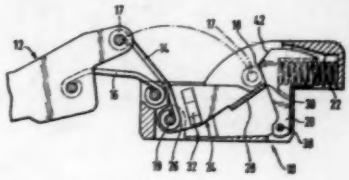
## 4,422,214
## OVER-CENTER HINGE

Karl Lautenschläger, and Gerhard Lautenschläger, both of Reinheim, Fed. Rep. of Germany, assignors to Karl Lauteschläger KG, Reinheim, Fed. Rep. of Germany

Filed May 7, 1981, Ser. No. 261,472
Claims priority, application Fed. Rep. of Germany, May 13, 1980, 3018184
Int. Cl.³ E05D 11/10; E05F 1/12
U.S. Cl. 16—291 10 Claims

1. An over-center hinge for a cabinet door, said hinge comprising: a supporting-wall-related part adapted to be fastened to the supporting wall of a cabinet, a door-related part constructed as a plug-in cup for insertion in a door, a linkage mechanism pivotingly joining the supporting-wall-related part to the door-related part, a tongue mounted in said cup, a compression spring biasing said tongue toward the interior of the cup, said tongue being mounted for pivoting about an axis over a given angle and having a profile surface projecting slantingly into the interior of the cup, a contact surface being provided at the link end of the supporting-wall-related part, said contact surface sliding during a portion of the opening and closing movement of the hinge between the hinge closed position and dead-center position on said profile surface and urging the door into its closed position, an abutment edge being provided on a detent element which, in said dead-center position, engages the tongue on the one hand and the plug-in cup on the other and holds said tongue in the dead-center position, said detent element being constructed and arranged such that, in the portion of the hinge movement between the dead-center position and the closed position, it is forced out of a tongue holding position into a tongue releasing position, said detent



element being a rocking lever which is fulcrumed within the plug-in cup in an area opposite the pivot axis of said tongue and which has a free end pointing toward the tongue, and which terminates in said abutment edge disposed parallel to said pivot axis, said rocking lever being constructed for pivoting upwardly in the cup interior from a position wherein the abutment edge is below said profile surface of the tongue to a position in which said abutment edge holds said tongue just in its dead-center position.

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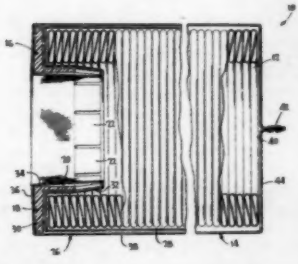
## 4,422,215
## SHEATHED HOLLOW STICK OF SHIRRED CASING

J. Alfons F. Liekens, Olen, and Ivo G. M. Hendriks, Overpelt, both of Belgium, assignors to Teepak, Inc., Chicago, Ill.

Filed May 27, 1981, Ser. No. 267,283
Int. Cl.³ B65B 5/00, 11/00
U.S. Cl. 17—1 R 10 Claims

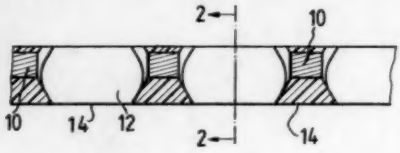


1. A sheathed hollow stick of shirred casing comprising an elongated shirred casing stick, a net-like sheathing telescoped over said stick in shape retaining relation and a unitary holding means comprising, a single flexible calibrated ring telescoped in one end of said stick, said ring including an inwardly projecting sleeve portion and said holding means being retained in said stick by a reversely folded portion of said sheathing.

## 4,422,216
## DEVICE FOR SEPARATING MEAT FROM BONES

Markus Spötzl, Forstenrieder Allee 128 b, D-8000 München 71, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 170,445, Jul. 21, 1980, abandoned. This application Jan. 20, 1982, Ser. No. 340,962
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1979, 2929836; Jan. 21, 1981, 3101842
Int. Cl.³ A22C *17/04*
U.S. Cl. 17—1 G 9 Claims




1. A device for separating meat from bones, comprising:
a drive element; and
an elongated, flexible cutting strand coupled to said drive element for movement along a travel path parallel to its longitudinal direction, said strand being unsupported over a portion of its length, and being provided with spaced-apart cutting elements having their cutting edges aligned and extending in the longitudinal direction of said cutting strand.

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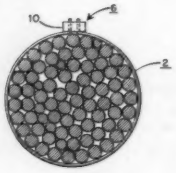
## 4,422,217
## PACKAGING FASTENER

Richard P. Barrette, 8 Lee St., South Lancaster, Mass. 01523

Filed Jul. 2, 1981, Ser. No. 280,116
Int. Cl.³ B65D *63/00, 67/02*
U.S. Cl. 24—16 R 4 Claims

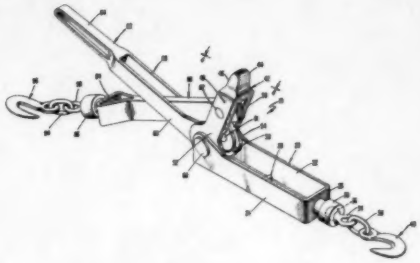



1. A packaging fastener for use with a flexible strap comprising
a molded body having substantially parallel first and second passageways therein each defining means for receiving an end portion of said strap,
bridge means formed integrally with said body and forming at least a partial separation between said passageways,
an anchor member having a base portion positioned within said body and supported by said bridge means, and
first and second locking ears forming an integral part of said anchor member and extending from opposite ends of said base, said ears being flexibly retained in said body and extending respectively into said first and second passageways at an acute angle with respect to the longitudinal axis of the respective passageway,
whereby when said strap is inserted in a first direction into either of said passageways the respective locking ear flexes to permit passage of said strap in said first direction and engages the strap to resist movement in the opposite direction.

## 4,422,218
## LEVER-TYPE LOAD BINDER

Gerald G. Brasseux, Abbeville, La., assignor to Dominion Chain Inc., Ontario, Canada

Filed Apr. 21, 1980, Ser. No. 141,975
Int. Cl.³ B66F *3/00*
U.S. Cl. 24—68 CT 13 Claims



5. A lever-type load binder comprising:
a lever member;
first means for engaging the load binder to a first load, which first means is pivotably connected to said lever member to enable said lever member to pivot with respect to said first engaging means about a pivot axis;
second means for engaging the load binder to a second load, which second engaging means is pivotably connected to said lever member at a point displaced from the point of attachment of said first engaging means; and
actuating means for pivoting said lever member about said pivot axis, said actuating means being pivotably connected to said first engaging means and pivotable with respect to said lever member.

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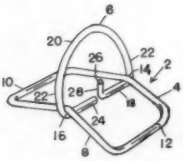
## 4,422,219
## BUCKLE

Joseph Kepiro, R.D. #2, Parkesburg, Pa. 19365

Filed Jul. 1, 1982, Ser. No. 394,315
Int. Cl.³ A44B *11/24;* B68B *5/00*
U.S. Cl. 24—176 1 Claim




1. A method of making a buckle comprising:
(a) bending a first wire with two ends into a generally rectangular shape with two long sides and two short sides and fastening together said two ends,
(b) bending the rectangular shape at the midregion of the two long sides to form an obtuse angle between the two long sides,
(c) bending a second wire with two ends into a generally dome-shaped second shape with one straight long side, one curved long side and two short sides,
(d) bending one end of said second wire into the area and plane of said second shape so formed at the midregion of said long straight side,
(e) fastening the second wire to the first wire with the long side of the second wire having the bent end positioned at the midpoint of the two long sides of the first wire, and

said bent end extending perpendicular to a plane parallel to and intersecting with the two short sides of the first wire and away from the obtuse angle of that first wire.

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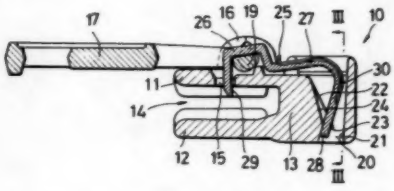
4,422,220

## AUTOMATIC LOCK SLIDER FOR SLIDE FASTENERS

Kiyoshi Oda, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Feb. 24, 1982, Ser. No. 351,745
Claims priority, application Japan, Feb. 25, 1981, 56-25510
Int. Cl.³ A44B 19/30
U.S. Cl. 24—421 5 Claims




1. An automatically locking slider for a slide fastener having a pair of coupling element rows, said slider comprising:

(a) a slider body including a pair of first and second wings joined at one end by a neck so as to define therebetween a generally Y-shaped guide channel for the passage of the pair of coupling element rows, said first wing having an aperture communicating with said guide channel, said neck having a pair of laterally spaced cam surfaces extending from said first wing and each terminating in a transverse abutment to jointly define a locking-member retaining nose adjacent to said second wing;

(b) a pair of laterally spaced lugs on said first wing, one on each side of said aperture;

(c) a pull tab pivotably connected to said lugs and having a transverse spindle journaled thereby; and

(d) a locking member pivotably supported on said slider body and including a resilient strip having

(1) a U-shaped base extending around said transverse spindle and normally urged thereagainst by the resilience of said strip, said base being angularly movable away from said first wing in response to the pivotal movement of said pull tab against the bias of said strip,

(2) an anchor extending from one end of said base and terminating in a shank having a pair of shoulders projecting from the distal end thereof, said shank lying between said cam surfaces, and said shoulders each being trapped by said abutments thereof within said neck, said distal end being urged against said nose by the resilience of said strip and thereby prevented from coming out of interlocking engagement with said nose, and

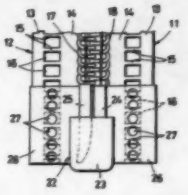
(3) a locking prong extending from the other end of said base for normally projecting into said guide channel through said aperture to lockingly engage with a pair of coupling element rows, said locking prong being retractable from said guide channel into said aperture in response to the angular movement of said base away from said first wing.

4,422,221

## SEPARABLE SLIDING CLASP FASTENER

Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 331,876
Claims priority, application Japan, Dec. 24, 1980, 55-182103
Int. Cl.³ A44B 19/00
U.S. Cl. 24—434 7 Claims




1. A separable slide fastener comprising:

(a) a pair of stringer tapes each having a series of openings spaced longitudinally thereof at first intervals;

(b) a pair of rows of coupling elements mounted on and along a pair of opposite longitudinal edges of said stringer tapes, respectively;

(c) a slider movable along said pair of rows of coupling elements for engaging and disengaging the latter;

(d) a separable bottom end stop comprising a box and a box pin extending therefrom, which are mounted on one of said stringer tapes at one end thereof, and a locking pin mounted on the other stringer tape at one end thereof and receivable in said box; and

(e) a reinforcement strip of textile material mounted on each of said stringer tapes at said one end and adjacent to said separable bottom end stop, said strip having a plurality of apertures spaced longitudinally thereof at second intervals and arranged substantially in alignment with said openings in each of said stringer tapes.

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4,422,222

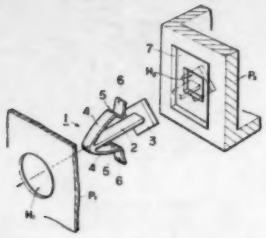
## FASTENING STRUCTURE

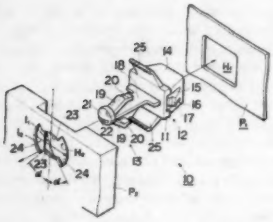
Yoshiaki Notoya, Zushi, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Oct. 21, 1981, Ser. No. 313,521
Claims priority, application Japan, Nov. 5, 1980, 55-157333[U]
Int. Cl.³ A44B 17/00, 21/00
U.S. Cl. 24—614 3 Claims

1. A fastener for detachably fastening first and second workpieces together, said first workpiece having a through aperture of predetermined shape, said second workpiece having a through aperture of predetermined shape including a first small diameter portion having first opposed edges spaced apart a first predetermined distance and a second annularly displaced portion having second opposed edges spaced apart a second relatively larger predetermined distance, said fastener comprising: a base, a first catch portion integral with and extending outwardly from a first side of said base, said first catch portion being insertable into and engageable within said first workpiece aperture for securing the fastener with respect to the first workpiece; a second catch portion integral with and extending outwardly from said base oppositely from said first catch portion, said second catch portion including an axially twistable resilient stem twistable in rotation relative to and independently of the base and the first catch portion remaining in engagement with the first workpiece from a normal relaxed position to a twisted rotated position reactively urged to return to the normal position and a pair of resilient catch members on the stem in distal relation to the base and normally assuming an outward position, said catch members including workpiece engageable surfaces normally spaced apart a distance greater than said first predetermined distance and less than said second

predetermined distance, said catch members being resiliently collapsible upon axial insertion between said first opposed edges defining the first predetermined distance for enabling said surfaces to be snapped through said second workpiece aperture for engaging said first opposed edges and securing the second workpiece with respect to the fastener; and means integral with an outer end of said stem for enabling the stem to be twisted from its normal position relative to the base to its rotated position with bodily similar rotation of the catch members with the outer end of the stem relative to the base for angularly spacing said catch members in their normal outward positions for disengagement from said first opposed edges by registry thereof between the second opposed edges and for withdrawal from the second workpiece aperture between said second opposed edges whereby, upon disengagement of the fastener, the stem with the catch members is reactively rotated to the normal positions thereof in readiness for repeated snap reengagement of the catch members with the first opposed edges to assemble the fastener with the disengaged workpiece.





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**4,422,223**

## FIXED CLOTH SPEED INSPECTION MACHINE

**Robert L. Haines, 17 Wolf Ave., Reisterstown, Md. 21136**

**Filed Aug. 1, 1980, Ser. No. 174,467**
**Int. Cl.³ D06H *3/04***
**U.S. Cl. 26—70** **16 Claims**

**1.** In a cloth inspection machine having a supply mount from which cloth may be drawn, a take-up mount about which said cloth may be wound and accumulated, a cloth viewing area between said supply and take-up mounts, drive means for rotating said take-up mount to wind and accumulate said cloth thereon including a motor and means for changing the speed of said drive means, the improvement being said speed change means comprising:

means for sensing the speed of said cloth at said viewing area when it is being inspected;

control means responsive to said sensing means output for varying directly the speed of said motor to maintain a substantially constant linear speed of said cloth as it passes through said viewing area;

said drive means including a fixed ratio drive system interconnecting said motor and said take-up mount;

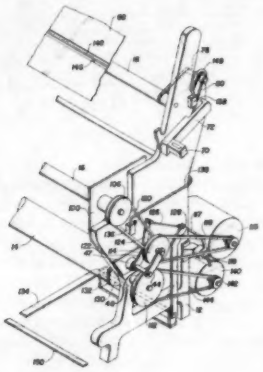
a rotatable measuring drum positioned between said supply mount and said take-up mount;

means connected to said measuring drum for detecting that said sensing means cannot monitor the speed of the end of the cloth after the end of the cloth has moved past said measuring drum and yet is not completely accumulated on said take-up mount and out of the viewing area; and

means responsive to said detecting means for substituting a fixed input to said control means for the input from said sensing means.

**16.** In a cloth inspection machine having a supply mount, a take-up mount, a cloth viewing area between said supply and take-up mounts, drive means for rotating said take-up mount including a motor means for changing the speed of said drive means, the improvement comprising:

said speed change means including means for sensing the speed of the cloth being inspected and control means responsive to said sensing means output for varying the speed of said motor to maintain a substantially constant linear speed of said cloth;



including a drive means for rotating said supply mount and a reversing means for energizing said supply mount drive means wherein said supply mount drive means includes a second motor and a second control means for running said second motor at a fixed speed when said reversing means is activated;

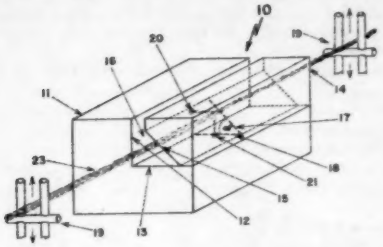
said take-up mount drive means including means for interconnecting said take-up mount motor and said take-up mount and wherein said interconnecting means includes a first pulley on the output of said take-up mount motor, a second pulley on said take-up mount, a third and fourth pulley on a common shaft, a belt between said first and fourth pulleys, a belt between said second and third pulleys, said common shaft being mounted to move relative to said take-up mount; and

said reversing means including a disabling means connected to said common shaft to move the axis of said common shaft relative to said take-up mount to slacken the belt between said second and third pulley to effectively disconnect said take-up motor from said take-up mount when said reversing means is activated.

## 4,422,224
## APPARATUS FOR INTERLACING MULTIFILAMENT YARN

James A. Gusack, Williamsburg, Va.; David O. Bird, Arnprior, Canada; Ernest C. Thomm, Sarnia, Canada, and William A. Reitz, Renfrew, Canada, assignors to Badische Corporation, Williamsburg, Va.

Filed Dec. 17, 1981, Ser. No. 331,868
Int. Cl.³ D02G 1/16; D02J 1/08
U.S. Cl. 28—272 3 Claims




1. A device for interlacing multifilament yarn, which device comprises the cooperative combination of:

(a) a body member having two planar orthogonal yarn-treating faces;

(b) a cover member secured to the body member, the cover member having a coacting surface which is spaced from the first yarn-treating face to form a yarn passageway, the coacting surface of the cover member so positioned with respect to the yarn-treating faces that an angle of about 45 degrees is formed by the intersection of: (1) a line resulting from the intersection of the coacting surface and any plane mutually orthogonal to the coacting surface and to the yarn-treating faces and (2) a line resulting from the intersection of said orthogonal plane and the second yarn-treating face;

(c) means for controlling the velocity and direction of travel of a multifilament yarn into and out of the yarn passageway;

(d) a coactive pair of fluid conduits in the body member, one conduit terminating perpendicularly to each of the yarn-treating faces in an orifice therein which is positioned to direct fluid against the coacting surface of the cover member, the longitudinal axes of the conduits at the terminations thereof lying in a plane mutually orthogonal to the coacting surface and to the yarn-treating faces; and

(e) means for the supply of fluid to the conduits.

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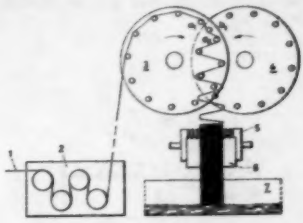
## 4,422,225
## APPARATUS FOR DEPOSITING A MOVING FIBER STRAND AS FOLDED LOOPS

Herbert Kurzke, Bobingen, Fed. Rep. of Germany, assignor to Vepa Aktiengesellschaft, Riehen, Switzerland

Filed Sep. 19, 1979, Ser. No. 77,157
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1978, 2840664; Oct. 21, 1978, 2845881
Int. Cl.³ B65H 57/76; D01D 7/00
U.S. Cl. 28—289 1 Claim

1. An apparatus for depositing a moving fiber strand as folded loops into a storage means, which comprises a strand feeding device, an intermediate depositing means consisting of two driven wheels rotating in mutually opposite directions and having annularly arranged guide pins for conveying and guiding the strand in a zigzag path to form the strand into a plurality of folded loops, said two wheels being arranged parallel to each other so that the guide pins of each wheel will be successively interspaced during rotation of the wheels and so that the space between the wheels is greater than a length of a guide pin, the pins being axially aligned on each wheel and the pins on each wheel being mutually displaced from each other and being sufficient in number so that more than three pins are simultaneously in contact with the strand during passage through the intermediate depositing means; a conveyor means for receiving the folded loops falling from said intermediate depositing means and for conveying said folded loops so that the loops will be deposited in close juxtaposition within said storage means, said conveyor means being arranged below the




intermediate depositing means and above the storage means for decelerating the fall of said loops; and the storage means being arranged for receiving the loops by free fall from the conveyor means; said conveyor means comprising a driven conveyor drum provided with circumferentially parallel grooves engaged by a finger-like strand stripper.

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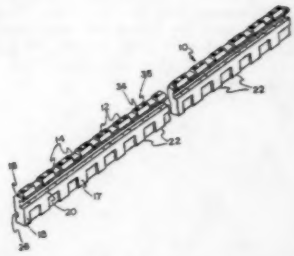
## 4,422,226
## PROCESS FOR PRODUCING CRYSTAL RESONATORS

Roger W. Hunt, Greensboro, N.C.; Brian T. Miller, Leland, and Donald R. Schroeder, Sandwich, both of Ill., assignors to CTS Corporation, Elkhart, Ind.

Division of Ser. No. 177,983, Aug. 14, 1980, Pat. No. 4,371,078. This application Sep. 24, 1982, Ser. No. 422,574
Int. Cl.³ H01L 41/22
U.S. Cl. 29—25.35 10 Claims



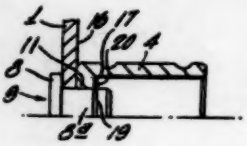

1. A process for producing electrical components having a plurality of terminals, including the steps of mounting said components upon a pallet having a plurality of regularly spaced bosses and teeth means, each of said bosses including openings for receiving the terminals of the respective components, passing such terminals through a longitudinal groove of said pallet to provide access to respective pairs of said terminals for operations such as the individual testing of said components, mounting said pallet for longitudinal slideable guided movement, and thereafter advancing the pallet by means complementary with said teeth means engaging said teeth means to move the pallet, through a station in which one of said operations is completed as said components move through the station.

4,422,227

## ROLLER ASSEMBLY

Peter Illg, Schlaitdorf, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 8, 1980, Ser. No. 213,847
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1979, 2950841
Int. Cl.³ B21B 31/02
U.S. Cl. 29—116 R 2 Claims



1. A tension roller assembly adapted to be mounted on a holder having an opening therein comprising an elongated guide bolt member having an axial bore therethrough, a radially inwardly directed annular collar of small axial extension at one end of said guide bolt member adjacent the face thereof abutting a front face of the holder, said collar forming an opening of essentially the same size as said opening in said holder and smaller than the remainder of said axial bore, a fastening member having an enlarged head portion abutting the rear face of the holder and a shank portion engaging through said opening in the holder and having abutment means for securing it to said guide bolt member adjacent said annular collar and a roller body member circumscribing and radially spaced from the guide bolt member, said abutment means comprising an expanding ring engageable in an annular slot on the generatrix of the fastening member and confronting said annular collar and a plurality of rolling elements in the annular space between the roller body member and the guide bolt member which engage in raceways formed in said confronting surfaces, said collar being located outside the zone of the race ways for the rolling elements.

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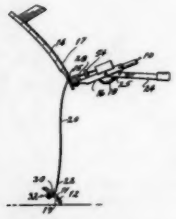
4,422,228

## MOLDBOARD BIT INSTALLING TOOL AND METHOD

Orville B. Chapman, Box 414, Chewelah, Wash. 99109, and George O. Prufer, Rte. 2, Box 488, Deer Park, Wash. 99006

Filed Jun. 25, 1981, Ser. No. 277,235
Int. Cl.³ B21H 7/00; B21K 19/00
U.S. Cl. 29—148.3 7 Claims



1. A method for bolting an elongated apertured bit having front and back surfaces to a similarly apertured moldboard having front and back surfaces with a moldboard bit installing tool comprising:

securing the moldboard bit installing tool to a back surface of the moldboard by inserting studs outwardly projecting from an elongated base of the tool into mating apertures in the moldboard;

inserting a free end of a winch cable from the tool through an aperture in the moldboard from the back of the moldboard and through a corresponding aperture in the bit from a back surface of the bit;

securing the cable free end to the bit by fastening a terminal affixed to the cable free end to the bit at a front surface of the bit;

hoisting the bit into mounting position in relation to the moldboard by operating a handle means that winds the cable about a winch drum;

bolting the bit into position by installing bolts through the apertures in the bit and moldboard;

removing the cable free end from the bit by releasing the terminal affixed to the cable free end from the bit front surface;

removing the bit inserting tool from the moldboard by disengaging the tool studs from the moldboard;

installing bolts through apertures in the moldboard and bit previously occupied by the tool studs and cable.

2. A moldboard bit installing tool for hoisting and lowering an elongated, apertured bit to and from a mounting position in relation to a similarly apertured moldboard, said tool comprising:

a winch frame;

a winch drum rotatably mounted to the winch frame;

winch cable on the winch drum, the cable extending to a free end;

handle means operably connected to the winch drum for forcibly rotating the winch drum to wind and unwind the cable on the drum;

an elongated base frame mounted to the winch frame;

outwardly projecting studs on the base frame, each stud spaced from one another by a multiple of a distance corresponding to spacing between apertures along the moldboard;

the studs being received through appropriate moldboard apertures such that the winch drum and cable are in alignment with an aperture in the moldboard;

a cable terminal affixed to the free cable end and adapted to be inserted through corresponding moldboard and moldboard bit apertures; and

means on the cable terminal for releasably securing the cable terminal to the moldboard bit through an aperture thereof.

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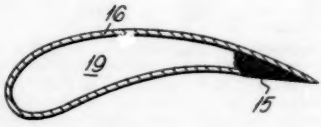
4,422,229

## METHOD OF MAKING AN AIRFOIL MEMBER FOR A GAS TURBINE ENGINE

John H. R. Sadler, Aston-on-Trent; George Pask, Stanton-by-Bridge, and Wilfred H. Wilkinson, Turnditch, all of England, assignors to Rolls-Royce Limited, London, England

Division of Ser. No. 121,481, Feb. 14, 1980, abandoned. This application Dec. 16, 1981, Ser. No. 331,201
Claims priority, application United Kingdom, Feb. 24, 1979, 7906623
Int. Cl.³ B23P 15/02, 13/00
U.S. Cl. 29—156.8 H 5 Claims



1. A method of making an aerofoil member for a gas turbine engine, the aerofoil member having an aerofoil-shaped exterior surface and a hollow interior with a plug of reticulated porous material filling a region of the hollow interior and forming at least a part of the exterior surface of the aerofoil member whereby cooling fluid can pass from the hollow interior

through the plug to the exterior of the aerofoil member, said method comprising the steps of:

forming a composite core having a solid portion defining the hollow interior of the aerofoil member and a porous portion of reticulated foam material defining the region for and the pores for the plug of porous material;

providing a mold around the core with a clearance therebetween to define the exterior surface of the aerofoil member;

then casting metal into the clearance formed between the composite core and the mold and into the porous portion of reticulated foam material of the composite core so that the reticulated porous plug is cast as an integral part of the hollow aerofoil member;

and then removing the mold and the composite core from the cast aerofoil blade member.

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**4,422,230**

**METHOD FOR PRODUCING WORKBENCH FOR A WIG**

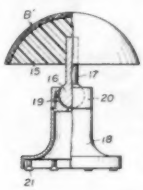
**Nobuo Nemoto, Chofu, Japan, assignor to Aderans Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 123,231, Feb. 21, 1980, abandoned. This application Aug. 25, 1981, Ser. No. 295,979**

**Claims priority, application Japan, Feb. 28, 1979, 54-21924; Feb. 28, 1979, 54-21925**

**Int. Cl.³ B29C** *24/00, 5/00, 23/00*

**U.S. Cl. 29—434** **4 Claims**




1. In a method for producing a workbench for a wig, fitted to the head of the person who is to wear the wig, the steps comprising:

holding a semitranslucent sheet of trans-1,4-polyisoprene, having a tensile strength about 290 kg/cm$^2$, elongation about 450%, Shore C hardness about 78, density about 0.96 g/cm$^3$, having a length and width about 33 cm, having a melting point of about 67° C. and a thickness of about 2 mm, in a perimetral clamping frame while heating the sheet as a whole to a temperature beyond that at which it softens and until it turns transparent;

allowing the sheet to partially cool to a temperature at which it is still soft and moldable but can be touched by a human hand;

pressing the partially cooled sheet against the top of the head of the person who is to wear the wig sufficient to cause said head to bulge the central portion of said sheet to the shape of the top of said head and maintaining said bulge by holding the clamping frame by hand until the sheet has further cooled sufficient to turn semitranslucent again;

then removing the sheet from the head and marking a line on said bulge to indicate the portion thereof desired for a wig base for use of said bulge as a female mold;

coating a fluorine plastic lubricant on the inside of said female mold;

mixing a fluid workable resin comprising a phenolic foam containing an epoxy resin and phenol balloons with a modified aliphatic polyamine hardening agent;

pouring the thus-obtained mixture into the lubricant coated female mold and spreading same to said marked line to form an open bowl-like layer of the workable resin in a thickness of about 5 mm and leaving same to harden;

thereafter releasing said hardened resin member to obtain a hollow male mold;

subsequently filling the hollow of the male mold with expanded polyurethane and allowing same to harden;

embedding a stick at one end into the polyurethane fill;

fitting a spherical portion at the other end of the stick into a semispherical concavity formed at an upper end of a stand and fitting a cap to the stand to hold said spherical portion, to thereby prepare a workbench for said wig, the workbench being fitted to the head of the person who is to wear the wig made thereon.

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**4,422,231**

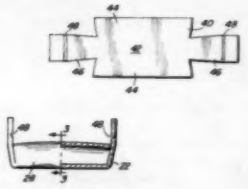
**METHOD OF FORMING A BLOCK FOR A METAL BELT**

**Kenneth A. Braybrook, Letchworth, England, assignor to Borg-Warner Corporation, Chicago, Ill.**

**Division of Ser. No. 167,261, Jul. 9, 1980, abandoned. This application Feb. 18, 1982, Ser. No. 349,806**

**Int. Cl.³ B21D** *39/00;* **B23P** *11/00*

**U.S. Cl. 29—509** **4 Claims**




1. In a method for constructing a power transmission drive belt, especially adaptable for use in transmissions having variable pulleys, having a continuous metal-containing band with upper and lower surfaces and drive blocks connected thereto, each drive block having side surfaces adapted to frictionally engage the flanges of said pulleys of said transmission; the improvement which comprises the steps:

(a) providing a plurality of essentially cross-shaped blanks each having a body with extending side and end portions;

(b) bending said sideportions of each blank to form a hollow central member having an upper surface and a lower surface;

(c) bending said end portions of each blank to extend upwardly of said upper surface;

(d) assembling each so formed blank with its upper surface in juxtaposition to the lower surface of said band and its end portions extending above the upper surface of said band; and

(e) bending said end positions extending above the upper surface of said band over said band.

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**4,422,232**

**ELECTRONIC COMPONENT INSERTION MACHINE**

**Stanley R. Vancelette, Manchester, N.H.; Robert D. DiNozzi, Marblehead, Mass., and Mark V. Pierson, Binghamton, N.Y., assignors to USM Corporation, Farmington, Conn.**

**Filed Nov. 5, 1980, Ser. No. 203,562**

**Int. Cl.³ H05K** *3/30*

**U.S. Cl. 29—564.2** **14 Claims**

1. A machine for inserting electronic components, said components having a body and dual in-line parallel leads extending from the sides thereof, said machine comprising:

a picker means for inserting said components;

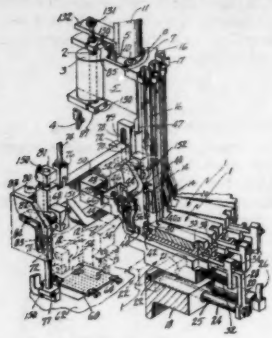
at least one transfer unit with a magazine having side walls formed therein;

means movably supporting said at least one transfer unit for movement with respect to said picker means;

means for retaining a component supply movable with said transfer unit, said component supply holding said components in a predetermined orientation, said retaining means

being arranged to dispose said components supply above said magazine whereby said components can drop, one at a time, into said magazine;

former means and ejector means disposed in said transfer unit, said former means being arranged to urge the leads of said component toward the side walls to shape them, said ejector means being arranged to engage one side of the



body of the component for transfer from the magazine; and

said picker means including a pusher, said pusher being arranged to engage the other side of the body of the component whereby it can be disposed between said ejector and said pusher for transfer from said magazine into said picker.

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**4,422,233**

## METHOD FOR PRODUCING HIGH TEMPERATURE ELECTRICAL CONNECTION

**Edward P. Habdas; Jon D. Aaron, both of Decatur, and Timothy H. Whitten, Hartselle, all of Ala., assignors to UOP Inc., Des Plaines, Ill.**

**Division of Ser. No. 297,908, Aug. 31, 1981, Pat. No. 4,378,279. This application Sep. 30, 1982, Ser. No. 429,339**

**Int. Cl.³ H01G** *9/24*

**U.S. Cl. 29—570** **10 Claims**

1. An improved method for attaching a lead wire of considerable thickness to a surface of a ceramic member which shrinks when fired and which then undergoes considerable thermal expansion relative to the wire during use comprising the steps of: selecting a length of a primary lead connection wire having a sufficient thickness to withstand substantial flexure after assembly to the ceramic member but too much thickness to be capable of maintaining a glass frit bond with said surface of said member during repeated cyclings of the member to elevated temperatures; selecting a length of a secondary lead attachment wire having a thickness which is insufficient to withstand substantial flexure after assembly to the ceramic member and small enough to be capable of maintaining a glass frit bond with said member after said member expands at a different rate than said secondary lead wire when heated repeatedly during use; attaching one end of said secondary lead attachment wire relative to said primary lead attachment wire so it contacts said primary wire at a location where said primary wire cannot be flexed after assembly; forming an opening in said ceramic member and placing at least said primary wire in said opening before said ceramic member is fired; firing said ceramic member to cure it and to cause the inside surface of said opening to shrink and lockingly engage at least said primary wire; applying a coating of conductive frit to said surface of the ceramic member and to the other end of said secondary wire after it is bent over into contact with said surface; and again firing said ceramic member frit and lead wire assembly to fuse said conductive frit and bond said secondary lead wire to said surface.

6. An improved method of assembling a lead connection to the reference end of an oxygen sensor of the type having a generally tubular ceramic body which is closed at a sensing end by a portion of ceramic which is a solid electrolyte, said method comprising the steps of: selecting a primary lead connection wire of a material capable of withstanding the firing and operating temperatures of said sensor and of a thickness sufficient to withstand normal flexing during the life of the sensor, but too great to be capable of being retained in a bonded relationship to said ceramic body by a glass frit seal when differential expansion takes place between the ceramic and primary lead wire during a plurality of heating cycles; forming an opening in the reference end of said ceramic body while said body is in a green or unfired state, said opening being sized so that shrinkage of said body during firing will cause the internal wall of said opening to mechanically clamp said primary lead wire; selecting a secondary lead wire which is capable of resisting the firing and operating temperatures of said sensor and is thin enough so as to be capable of being retained in a bonded relationship to said ceramic body by a glass frit seal during a plurality of heating cycles, said secondary wire being too thin to withstand repeated flexing; placing at least the primary lead wire in said opening; firing said ceramic body to cure said ceramic and shrink the sides of said opening into clamping engagement with said primary wire; attaching one end of said secondary wire to a non-flexing portion of said primary wire; placing the other end of said secondary wire in contact with one end of a glass frit conductive lead stripe on the surface of the tubular body which is joined at its other end to an electrode coating on the solid electrolyte; covering said other end of said secondary wire with a paste layer of glass frit conductive material; and again firing the ceramic body to fuse said paste layer to said secondary wire.

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**4,422,234**

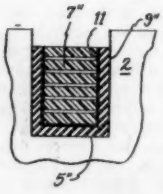
## METHOD OF MAKING A DYNAMOELECTRIC MACHINE COMMUTATOR STRUCTURE

**William B. Penn, and Martin A. Zgraggen, both of Erie, Pa., assignors to General Electric Company, Research Triangle Park, N.C.**

**Division of Ser. No. 244,586, Mar. 17, 1981, Pat. No. 4,341,972. This application Jan. 26, 1982, Ser. No. 342,872**

**Int. Cl.³ H01R** *43/06*

**U.S. Cl. 29—597** **4 Claims**



1. A method of making a commutator comprising the steps of:

(a) mounting a plurality of conductive commutator segments on a supporting hub in a cylindrical array and in insulated relationship to one another and to the hub,

(b) providing at least one annular groove in the outer cylin-

drical surface of the commutator segments for receiving a dielectric banding therein,

(c) coating the sidewalls of said groove with a solution of room temperature curable, flexible, thermally stable and electrical track resistant material and then allowing said coating material to at least partially cure,

(d) providing a layer of release material having one etched side, positioning the etched side of the layer of release material against the coating material in the groove and adhering the layer of release material to said coating material, thereby positioning it between the coating material and the commutator banding when the banding is positioned in the groove by step (e), so that thermal cycling of the banding will pull it away from the layer of release material but will not produce fissures between the coating material and the commutator segments,

(e) positioning a commutator banding in said groove against said coating, and

(f) applying more or said coating material over the edges of the radially outer surface of the banding to completely seal the junctions between the banding and the commutator segments against the deposit of electrically conductive contaminants in cracks or fissures at said junctions.

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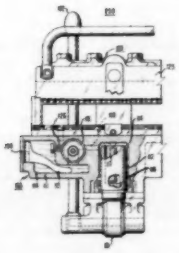
**4,422,235**

## TOOL FOR JOINING CONNECTORS

**Edward W. Becker, Winder; Paul R. Harville, Lilburn, both of Ga., and Glen E. MacLeod, Los Angeles, Calif., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Jan. 8, 1982, Ser. No. 338,120**
**Int. Cl.³ H01R *43/04***
**U.S. Cl. 29—749** **19 Claims**



1. A tool for assembling a connector including a plurality of elements, the tool comprising:

means for supporting connector elements during their assembly;

means for applying a force to a particular element positioned in the supporting means;

means for mounting the force applying means for reciprocal movement between a first and second position; the mounting means including:

first and second chambers with a passageway therebetween;

fluid contained within the first and second chambers and the passageway;

means responsive to the movement of the force applying means for transferring fluid from one chamber to another; and

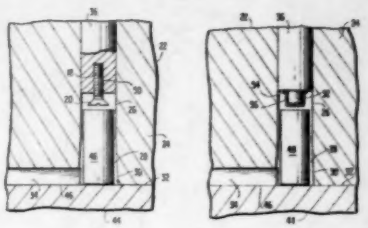
means for blocking the flow of fluid between the chambers to hold the force applying means in a particular position.

**4,422,236**

## METHOD OF EXTRUDING PARTS WITH CAPTURED FIXTURE

**James K. Ware, Jr., and Edward O. Wolcott, both of Gainesville, Fla., assignors to General Electric Company, Gainesville, Fla.**

**Filed Oct. 1, 1981, Ser. No. 307,696**
**Int. Cl.³ H01R *43/00***
**U.S. Cl. 29—876** **1 Claim**



1. A method of extruding a lead or lead alloy battery terminal of essentially pore-free material in which is captured a fixture comprised of a material harder than said lead or lead alloy, said fixture extending away from said battery terminal, said battery terminal having an essentially cylindrical boss and a radially extending arm element protruding from said boss, said method comprising:

providing a first die element having a rigid body with a cavity having the desired final geometry of said battery terminal cylindrical boss and a first bore extending from said cavity, said first die element further comprising a passage extending radially from said bore and having a geometry corresponding to the desired external geometry of said radially extending arm element;

providing a second die element disposed in contact with said first die element and defining therewith at least a portion of said cavity and a portion of said passage;

positioning within said first bore a third die element for axial movement therewithin and having an essentially cylindrical external geometry corresponding to the geometry of said first bore;

affixing said fixture of harder material to the end of the third die element facing toward said cavity;

positioning within said cavity a billet of material comprised substantially of lead, said material having a first porosity;

forcing said third die element and said fixture into contact with said billet thereby causing said material to extrude around said fixture affixed to said third die element to frictionally capture the fixture within said cylindrical boss and further causing said billet to extrude into said cavity to form said cylindrical boss, said forcing step further causing said billet to extrude into said passageway to form said radially extending arm element;

densifying said material of said first porosity by said forcing step sufficiently so as to provide a second porosity less than said first porosity and thereby provide an essentially pore-free battery terminal;

separating said first and second die element;

ejecting said terminal and said fixture from said cavity; and

detaching said fixture from said third die element.

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**4,422,237**

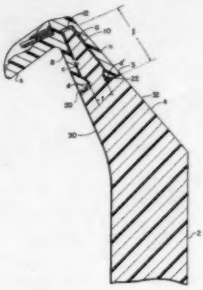
## RAZOR HANDLE

**Robert A. Trotta, Pembroke, Mass., assignor to The Gillette Company, Boston, Mass.**

**Filed Feb. 25, 1982, Ser. No. 352,146**
**Int. Cl.³ B26B *21/14***
**U.S. Cl. 30—85** **1 Claim**

1. A razor handle comprising an elongated grip portion, a neck portion extending from one end of said grip portion, and

a protrusion extending from an end of said neck portion remote from said grip portion, said protrusion having first and second major surfaces extending from a free end of the protrusion at which said surfaces are closest to each other, to a base portion of said protrusion at which said surfaces are farthest apart from each other, substantially wedge-shaped end walls interconnecting said surfaces along side edges of said surfaces, first and second lesser surfaces extending inwardly from said base portion and toward said end of said neck portion, a connecting web extending from said first and second lesser surfaces of said protrusion to said end of said neck portion, said connecting web being of lesser thickness than said protrusion base portion, whereby to provide recess means defined by said end of said neck portion and said protrusion web and said first and second lesser surfaces, said protrusion being in substantial alignment with said neck portion, and said grip portion, neck portion, web and protrusion being a unitary member.



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**4,422,238**

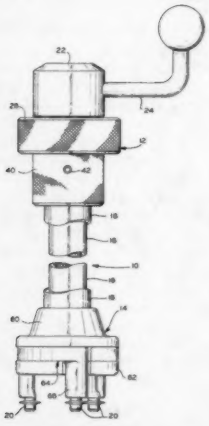
## SHOCK ABSORBER SHROUD CUTTING TOOL

**Kenneth D. Kloster, 6649 Mill Ridge Rd., Maumee, Ohio 43537**

**Filed Oct. 26, 1981, Ser. No. 314,706**

**Int. Cl.³ B23D *21/08;* B26D *3/16***

**U.S. Cl. 30—101** **10 Claims**



**1.** A tool for severing a cylindrical body comprising:

an elongate support member having a longitudinal axis;

cutting means mounted on one end of said support member and having at least one cutting element adapted to engage the outer wall of the cylindrical body, said cutting element being movable toward and away from the longitudinal axis of said support member, said cutting means including a lower support surface defining a cylindrical body engaging portion for supporting said cutting means on one end of the cylindrical body, said cutting element being positioned a predetermined distance below the lower support surface for severing the cylindrical body a predetermined distance from the one end of the body; and

control means mounted on the opposite end of said support member and coupled to said cutting means for selectively moving said cutting element toward and away from the longitudinal axis of said support member, said control means including means for revolving said cutting element about the longitudinal axis of said support member while simultaneously moving said cutting element toward the longitudinal axis whereby said cutting element is moved into engagement with the outer wall of the cylindrical body.

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**4,422,239**

## POWERED HANDTOOL

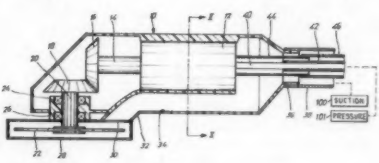
**Peter Maier, Gerokstr. 1, 7311 Neidlingen/Teck, and Hans-Dieter Tschacher, Hohenzollernstr. 4, 7313 Reichenbach, both of Fed. Rep. of Germany**

**Filed Oct. 1, 1981, Ser. No. 307,457**

**Claims priority, application Fed. Rep. of Germany, Oct. 11, 1980, 3038489**

**Int. Cl.³ B26B *25/00***

**U.S. Cl. 30—124** **5 Claims**




**1.** In a hand tool which includes a housing having a handle part which can be manually gripped, a tool rotatably supported on said housing, a motor provided in said housing, means for releasably drivingly connecting said motor to said tool, a protective hood which is supported on said housing and partially surrounds said tool, means defining a suction channel which communicates with said protective hood and with a connecting piece which is provided on said housing at a location remote from said tool, and a suction device having a hose which leads to and is releasably secured to said connecting piece and communicates with said suction channel, said handle part being elongate and said suction channel extending appropriately parallel to said handle part, the improvement comprising wherein said motor is provided in said handle part of said housing and, viewing said handle part in cross section, is arranged eccentrically in said handle part, and wherein said suction channel is provided within said handle part and extends past said motor on one side thereof.

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**4,422,240**

## CUTTING IMPLEMENTS

**Edward M. Wallace, Longmeadow; Robert G. Gosselin, Springfield, and Ernest D. Labarre, Holyoke, all of Mass., assignors to Wallace Mgf. Corp., Enfield, Conn.**

**Filed Mar. 18, 1982, Ser. No. 359,244**

**Int. Cl.³ B26B *13/06***

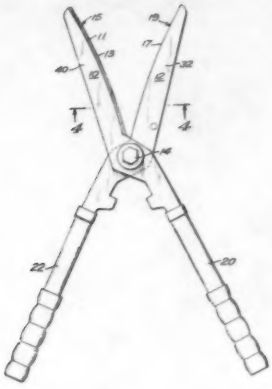
**U.S. Cl. 30—254** **9 Claims**

**1.** A cutting device comprising in combination:

a first elongate blade having a generally convex work-engaging-edge for engaging the work to be cut and an elongate handle portion,

a second elongate blade having a generally convex work-engaging-edge for engaging the work to be cut and an elongate handle portion,

a pivot means for pivotally linking together the first and second blades whereby the work-engaging edges of the blades oppose one another in facing relationship and in swinging in the closing stroke toward each other define an included angle,



the defined included angle between the work-engaging edges of the blades at any point of their intersection from the initiation to the termination of the closing stroke being a constant value,

the work-engaging-edges having bevels with the totality of the included angles of the edges being in the order of at least 80° and not in excess of 120°.

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**4,422,241**

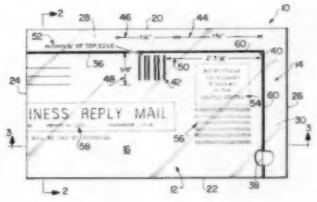
## MARK LOCATOR AND METHOD OF USING SAME

**David M. Meeker, Saratoga, Calif., assignor to Champion International Corporation, Stamford, Conn.**

**Continuation of Ser. No. 116,908, Jan. 30, 1980, abandoned. This application May 18, 1982, Ser. No. 379,492**

**Int. Cl.³ G01B** *5/14*

**U.S. Cl. 33—1 BB** **1 Claim**




1. A mark locator having indicia thereon for verifying conformity of markings of a mail article as being within the limits of postal specifications, said markings comprising a series of parallel lines of predetermined width, length and spacing, comprising:

a single rectangular transparent plate having opposed top and bottom edges and opposed side edges and having an upper and a lower surface, said upper and lower surfaces being parallel and planar;

first and second planar, perpendicularly oriented edge surfaces comprising rectangular bar members fixed to the lower surface of said plate adjacent and parallel to two adjacent edges of said plate and lying in first and second planes, respectively, substantially perpendicular to a plane containing said lower surface; and

indicia provided on said plate at predetermined locations defining an area relative to said first and second edge surfaces, said plate having coextensive first and second dimension lines of predetermined lengths parallel to said first edge surface and perpendicular to said second edge surface, said plate having a third dimension line of predetermined length parallel to said second edge surface and perpendicular to said first edge surface, said third dimension line extending from said first edge surface for a predetermined length and being in perpendicular relationship to said coextensive first and second dimension lines, said first dimension line extending from said second edge surface for a predetermined length to a point where the said second dimension line starts, said indicia comprising a replica of said markings, said replica being located in an area defined by said first edge surface, the length of said second dimension line and the length of said third dimension line, said plate having a pair of lines which overlie said first and second edge surfaces to define the position thereof.

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**4,422,242**

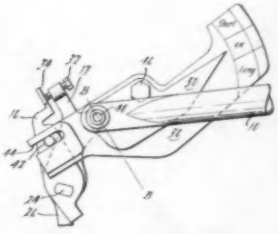
## THROTTLE VALVE LINKAGE ADJUSTMENT GAUGE AND METHOD THEREFOR

**Raymond Stocker, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Mar. 30, 1981, Ser. No. 249,578**

**Int. Cl.³ G01B** *5/00, 5/25*

**U.S. Cl. 33—181 AT** **5 Claims**



1. A gauge for adjusting the position of a first attachment on a first member with respect to a second attachment on a second member comprising:

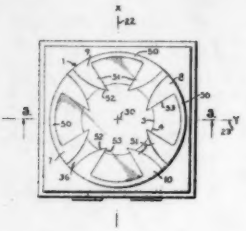
a gauge plate carrying a pivot and having a first joint adapted to connect the plate to the first attachment, means to position and support the gauge plate with respect to a pin providing a surface on which the gauge plate can move with respect to said pin, and markings on the surface of the gauge plate spaced radially from the pivot defining angular ranges about the pivot; and

a pointer rotatably connected to the gauge plate at the pivot having an indicator arm extending radially from the pivot and having a second joint thereon spaced radially from the pivot adapted to connect the pointer to the second attachment whereby the indicator arm points to the angular range markings according to the angular position of the second joint about the pivot.

## 4,422,243
## DUAL AXIS CAPACITIVE INCLINATION SENSOR

Amber N. Brunson; Deighton E. Brunson, both of Independence, and Walter W. Ray, Jr., Kansas City, all of Mo., assignors to Brunson Instrument Co., Kansas City, Mo.

Filed May 24, 1982, Ser. No. 381,010
Int. Cl.³ G01C 9/06
U.S. Cl. 33—366 15 Claims



5. A capacitive inclination sensing vial for varying capacitance in proportion to the inclination thereof and comprising:

(a) a vessel for containing a fluid, said vessel having associated therewith a horizontal axis about which inclination of said vial is to be sensed and a vial axis intersecting said inclination axis and perpendicular thereto, said vial axis being vertical when said vial is placed on a horizontal surface;

(b) a dielectric fluid contained and movable within said vessel;

(c) a common capacitor plate positioned on said vessel on one side of said fluid;

(d) an axis capacitor plate positioned on said vessel on an opposite side of said fluid from said common plate and defining a capacitor in cooperation with said common plate, the position of said fluid in relation to said axis plate and said common plate changing in response to the inclination of said vial about said inclination axis thereby changing the capacitance of said capacitor in proportion to the angle of said inclination; and

(e) said axis plate having a shape defined by:

(1) a web portion spaced from said vial axis and extending in a direction which is generally parallel to said inclination axis; and

(2) a pair of end portions connected at opposite ends of said web portion and extending generally toward said vial axis.

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## 4,422,244
## ELEVATION INDICATOR

Louis Gauthier, 115 Manning St., Hudson, Mass. 01749

Filed Dec. 4, 1981, Ser. No. 327,607
Int. Cl.³ G01C 5/04
U.S. Cl. 33—367 8 Claims

1. Elevation indicator, comprising:

(a) a supporting base,

(b) a reservoir for holding a quantity of liquid and supported on the base, said reservoir having a bottom opening,

(c) an elongated staff,

(d) an elongated scale mounted on the staff for longitudinal movement relative to the staff,

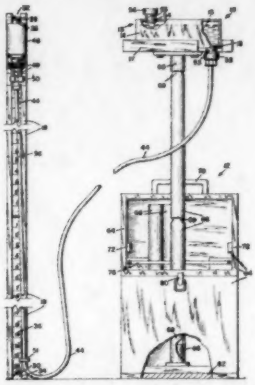
(e) a transparent tube mounted on the staff and extending along one side of the staff adjacent the scale,

(f) a flexible tube operatively connecting the bottom opening of the reservoir to the bottom of the transparent tube, so that liquid can flow from the reservoir to the transparent tube,

(g) a check valve comprising:

(1) a housing having a top opening and a bottom opening which is operatively connected to the top of the transparent tube,

(2) a partition between said top and bottom openings for dividing said housing into an upper chamber and a lower chamber, said partition having an opening extending between said chambers and a valve seat facing said lower chamber, and



(3) a ball located in said lower chamber between said bottom opening and the valve seat, said ball being capable of floating in the liquid which is in the reservoir so that when said lower chamber is filled with said liquid, the ball will rise into sealing engagement with the valve seat.

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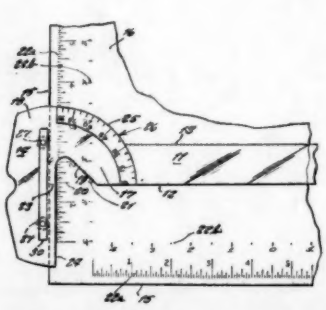
## 4,422,245
## TRIPOD OPEN THROAT T-SQUARE AND DRAFTING BOARD

Saul Schiller, 1709 Ave. I, Brooklyn, N.Y. 11230

Continuation-in-part of Ser. No. 28,198, Apr. 9, 1979, abandoned. This application May 14, 1980, Ser. No. 149,711
Int. Cl.³ B43L 13/02
U.S. Cl. 33—403 4 Claims



1. A scribing T-square comprising a blade having a straight edge along a first longitudinal axis of the blade, and a helve head unitary and rigidly connected with a proximal end of the blade, said helve head having a second longitudinal axis extending substantially at a right angle to said straight edge, and three spaced-apart rollers mounted in triangular relationship to one-another on said helve head at different locations of which each roller at at-least two locations relative to each other are substantially aligned along said second longitudinal axis and of which at at-least two locations relative to each other are sub-

stantially aligned in a direction substantially transverse to each of said first and second longitudinal axes such that a tripod support arrangement of the three spaced-apart rollers is formed, the three spaced-apart rollers being mounted on axes extending at substantially right angles to said first and second longitudinal axes such that support by said tri-pod support arrangement of rollers is preventative of wobbling of said helve head and said blade relative to a scribing board's upper surface during use of the scribing T-square when said three spaced-apart rollers are positioned on a first upright edge of a scribing board.

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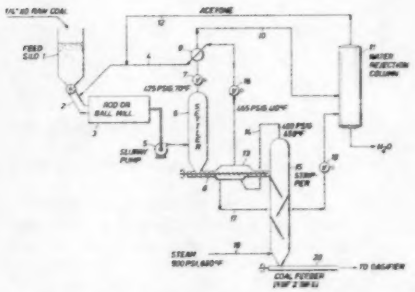
**4,422,246**

## PROCESS FOR FEEDING SLURRY-PRESSURIZED AND SOLVENT-DEWATERED COAL INTO A PRESSURIZED ZONE

**Donald E. Hardesty, Brookshire, and Glenn R. McCullough, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.**

**Filed Mar. 15, 1982, Ser. No. 358,168**
**Int. Cl.³ F26B *3/00, 7/00***
**U.S. Cl. 34—9** **5 Claims**




1. A process for feeding substantially dry coal fines into a pressurized zone comprising:

mixing moist coal fines with enough water-miscible, volatile, organic solvent containing from 1 to 4 carbon atoms to form a pumpable slurry of coal fines in water-containing liquid organic solvent;

pumping the slurry into a settling container, in which the solids are free to sink while the liquid rises, at a pressure exceeding the pressure in said pressurized zone;

separating organic solvent from the liquid which rises in said settling container and flowing the separated organic solvent into contact with said moist coal fines;

displacing the coal fines which sink in said settling container into heat exchange relationship with at least one hot pressurized gas which evaporates at least a significant portion of the water and organic solvent from the coal fines at a pressure exceeding the pressure in said pressurized zone to be fed; and,

displacing the resulting pressurized and relatively dry coal fines into the pressurized zone to be fed.

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**4,422,247**

## LOW VOLTAGE SENSOR FOR A DRYER

**Clifford L. Deschaaf, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.**

**Filed Jun. 29, 1981, Ser. No. 278,869**
**Int. Cl.³ F26B *21/10***
**U.S. Cl. 34—48** **9 Claims**

1. A control circuit for a dryer comprising:

a source of timing pulses;

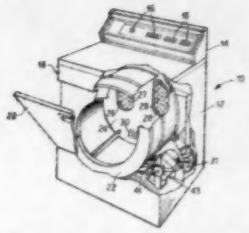
a resettable counter arranged to be incremented in accordance with said timing pulses;

moisture sensing means operative to sense the moisture content of the clothes load and reset said counter at a rate proportional to the sensed moisture content;

said moisture sensing means comprising

a conductivity sensor arranged to contact the fabric load and a microcomputer input/output port means for charging a capacitance means;

said capacitance means arranged to discharge through said conductivity sensor;



said port means arranged to selectively read the charged value of said capacitance means and reset said counter if said charged value is less than a predetermined value; and

control logic means for terminating the drying operation upon accumulation of a preselected count in said resettable counter.

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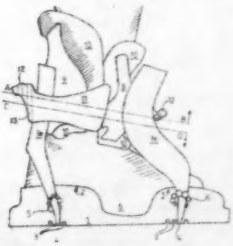
**4,422,248**

## SYSTEM FOR KEEPING THE FOOT AND THE LEG IN POSITION

**Jean R. Bataille, and Nicole J. J. Charollais Bataille, both of 20, rue du Commandant rene Mouchotte, Paris, France**

**Filed Sep. 4, 1980, Ser. No. 184,083**
**Claims priority, application France, Sep. 12, 1979, 79 22838; Aug. 19, 1980, 80 18134**
**Int. Cl.³ A43B *5/04***
**U.S. Cl. 36—121** **13 Claims**



1. A system for maintaining the foot and the leg in position, comprising two independent stirrups of unitary construction, each stirrup passing under and within a transverse groove of a rigid sole, one stirrup toward the front and one at the back of the foot, the lateral borders of the sole being raised along the edges of the foot, said stirrups cooperating respectively with a fore support assembly and a rear support assembly located on either side of the ankle.

**4,422,249**
**KICKING APPARATUS**
**William M. Hannah, 4011 W. Camelback, Apt. J-10, Phoenix, Ariz. 85019**
**Filed Mar. 16, 1981, Ser. No. 243,794**
**Int. Cl.³ A43B *5/00***
**U.S. Cl. 36—133** **9 Claims**

**1**. A soccer-style place kick type of kicking apparatus, comprising:

cover means for permitting a releasable attachment to a foot of a kicker; and

pad means coupled to said cover means having at least a defined elongated, planar football striking portion located substantially parallel to and surface overlying the inside instep portion of said foot for providing a regular striking surface with which to impact a place kicked football so that the control over the flight of the football can be improved.

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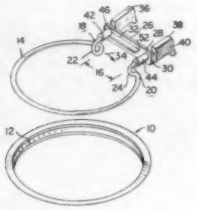
**4,422,250**
**EMBROIDERY HOOP**
**Dan Golan, 165 W. 66 St., New York, N.Y. 10023**
**Filed Jul. 12, 1982, Ser. No. 397,600**
**Int. Cl.³ D05C *1/04*; D06C *3/08***
**U.S. Cl. 38—102.2** **10 Claims**



**1**. A spring-type embroidery hoop or knitting ring comprising:

(a) an outer, circular, continuous, annular ring, said outer ring having an inner perimetral groove or the like in its inner surface;

(b) an inner circular ring, said inner ring having a gap and being composed of a springy material, so that said inner ring is resiliently deformable to a smaller generally circular shape than said outer ring, said inner ring being concentrically disposed within said outer ring, so that said inner ring nests in said groove;

(c) two spaced-apart fingers, each of said fingers extending generally radially outwards from said inner ring at one end of said gap; and

(d) restraining means comprising a clip member, said means extending between said fingers to curtail and prevent excessive lateral displacement of said two fingers away from each other beyond and greater than a fixed spacing distance upon removal of the outer ring from the inner ring, while permitting lateral movement and displacement of said two fingers towards each other, so that squeezing manipulation of said two fingers causes said two fingers to be spaced from each other a distance less than said fixed spacing distance, while concomitantly reducing the circumferential dimension of said inner ring, so that said inner ring may be moved in or out of said groove.

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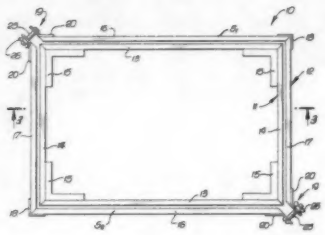
**4,422,251**
**APPARATUS FOR QUILTING**
**Virginia L. Hedrick, 1027 E. Francis St., Corona, Calif. 91720**
**Filed Apr. 16, 1979, Ser. No. 30,316**
**Int. Cl.³ D05C *1/04***
**U.S. Cl. 38—102.2** **3 Claims**



**1**. In a quilting matrix supporting apparatus, the combination of:

an inner rigid horizontal rectangular matrix-supporting frame;

an outer rectangular frame snugly fitting around said inner frame in co-planar relationship therewith, said outer frame being divided approximately along one of its diagonals into two right-angle-forming sections, each section embodying two contiguous rigidly united members of said outer frame; and

manually operable clamp means located at the apices of said diagonal of said outer frame to expansibly and contractibly unite the contingent pairs of ends of said two sections into which said outer frame is divided.

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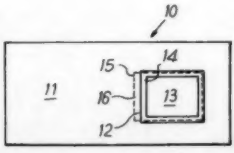
**4,422,252**
**DATA STORAGE CARDS AND METHOD OF HANDLING THEREOF**
**Anthony J. Wicks, Baughurst, Nr. Basingstoke, England, assignor to Wicks and Wilson Limited, Basingstoke, England**
**Filed Apr. 28, 1981, Ser. No. 258,292**
**Claims priority, application United Kingdom, Feb. 18, 1981, 8105088**
**Int. Cl.³ A47G *1/06***
**U.S. Cl. 40—159** **12 Claims**



**1**. In a data storage card having an aperture for receiving a photographic image, said aperture having at least in part an adhesive border, and including a disposable sheet which protects said adhesive border and which is mounted on said border but has release characteristics in relation thereto, characterized in that at one or more sides of said aperture said sheet extends

outwardly of said border to form an unadhered flap overlying said card, and said sheet is spaced from the edges of said card.

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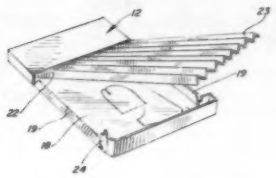
**4,422,253**

## MULTIPLE SEGMENTED DISPLAY DEVICE

**Marion G. Babberl, San Mateo, Calif., assignor to Rapid Mounting & Finishing Company, Chicago, Ill.**

**Filed Sep. 7, 1982, Ser. No. 414,969**
**Int. Cl.³ G09F *19/14***
**U.S. Cl. 40—453** **19 Claims**



**1.** A display device comprising:

a pleated sheet having a plurality of parallel folds defining corrugated front and rear surfaces, the pleated folded sheet defining opposite ends and opposite sides; and

a carrier defining a first end pocket for receiving one end of the pleated sheet, an opposite second end pocket for receiving the opposite end of the pleated sheet, and stop wall means at opposite sides thereof abutted by opposite side portions of the pleated sheet for limiting lateral expansion of the pleated sheet, the spacing between said stop wall means being preselected to maintain the folds of the pleated sheet at suitable angles to have a height substantially equal to the depth of said pockets for snug reception therein, said carrier being constructed to expose at least one of said corrugated surfaces for forming a pair of segmented displays thereon.

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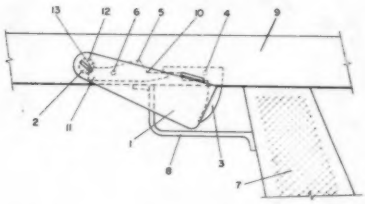
**4,422,254**

## SAFETY MECHANISM FOR FIREARMS

**Sidney J. McQueen, 414 Coors Blvd. SW., Albuquerque, N. Mex. 87105**

**Filed Feb. 8, 1982, Ser. No. 346,635**
**Int. Cl.³ F41C *17/00***
**U.S. Cl. 42—1 Y** **3 Claims**



**1.** A safety mechanism for firearms having a pivoting sear, said sear being forward of a trigger, said safety mechanism comprising:

a safety shaft having a safety flat, said safety shaft being rotatably installed through safety holes in side plates of the firearm, said safety holes being adjacent to a safety end of the sear; and said safety shaft having on each end an ear, said ear being essentially flat, and the plane of each ear being perpendicular to the plane of the safety flat; and

a safety channel having a back and two runners, a mounting end and a free end, and said safety channel having horizontal slots in the runners at the mounting end, said horizontal slots being sized to mate with the ears, and said safety channel having a trigger clearance slot in its back, and said safety channel having finger tabs on the runners at the free end to permit one-motion-movement of the safety channel and insertion of a trigger finger to the trigger, and said runners having a design and shape so that they will block access to the trigger; and

wherein the safety channel is mated to the safety shaft so that when the mechanism is in the safe position, the safety flat blocks movement of the sear.

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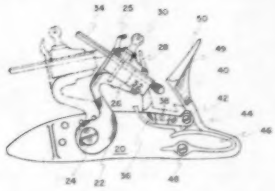
**4,422,255**

## MATCHLOCK CONVERTOR

**Michael L. Lapp, Box 221, Jerome, Pa. 15937**

**Filed Mar. 29, 1982, Ser. No. 363,060**
**Int. Cl.³ F41C *11/02***
**U.S. Cl. 42—69 R** **1 Claim**



**1.** In a firing mechanism for a flintlock rifle wherein an igniting means is carried within upper and lower jaws of a hammer, said jaws being tightened by a screw, and upon triggered release of the hammer the igniting means snaps forward and strikes an upstanding frizzen disposed above a flashpan thereby igniting flashpowder within said pan, the improvement comprising:

Said igniting means being a matchlock converter which comprises;

Upper and lower surfaces parallel to each other and to the jaws of the hammer;

a cut-out for the screw to pass through;

and angled holes passing through the converter converging toward the end of the converter nearest the frizzen, through which holes pyrophoric friction matches extend with their heads in contact with each other thereby increasing the likelihood of ignition upon firing.

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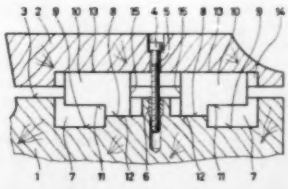
**4,422,256**

## ADJUSTABLE CHEEK-PIECE FOR A SHOULDER FIREARM

**Hans Maucher, Elchingen; Georg Zanner, Langenau, and Otto Repa, Oberndorf, all of Fed. Rep. of Germany, assignors to Carl Walther GmbH, Ulm, Fed. Rep. of Germany**

**Filed Jun. 11, 1982, Ser. No. 387,660**
**Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129182**
**Int. Cl.³ F41C *23/00***
**U.S. Cl. 42—73** **11 Claims**



**1.** In a shoulder firearm, a cheek-piece adjustable with respect to a gunstock, and at least one spacer member position-

able between a portion of said gunstock and said cheek-piece, said spacer member having a plurality of pairs of opposed parallel surfaces and the distances between each pair of parallel surfaces being different, each of said pairs of surfaces being positionable between the cheek-piece and the portion of the gunstock such that the distance between the cheek-piece and the gunstock can be varied to correspond to the distance between the pair of surfaces interposed between the gunstock and cheek-piece.

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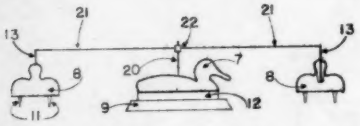
**4,422,257**

## CARROUSEL WILDFOWL DECOY

**Roy E. McCrory, 4044 Bishops Bridge Rd., Memphis, Tenn. 38118**

**Filed Dec. 21, 1981, Ser. No. 333,015**
**Int. Cl.³ A01M *31/06***
**U.S. Cl. 43—3** **9 Claims**




1. A carrousel wildfowl decoy comprising an array of auxiliary wildfowl decoy elements of hollow body construction, formed in the image of a duck, goose, or other wildfowl and, by suspension means, operatively connected to each other, also featuring as an element of the decoy a control decoy element similarily imaged, housing therein an electric circuit, said circuit including a battery and a motor, and means attached to said battery and motor for operatively connecting and pulling the array of auxiliary decoy elements to revolve around the control decoy element.

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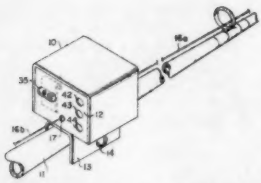
**4,422,258**

## SIGNALLING DEVICE AND MEASUREMENT OF PULL ON A FISHING LINE

**Billy R. Adams, P.O. Box 2526, Jacksonville, Fla. 32203, and William C. Burchett, 843 Bellefonte Princess Rd., Ashland, Ky. 41101**

**Filed Mar. 24, 1982, Ser. No. 361,237**
**Int. Cl.³ A01K *97/12***
**U.S. Cl. 43—17** **14 Claims**




1. A signalling device for use with a fishing rod and activated by a fishing line comprising
a compartment for the signalling device,
entering and exit passages to said compartment allowing a fishing line to pass through said passages and said compartment,
a switching means in said compartment to signal the amount of pull on the fishing line including
movable means moved by the fishing line a distance determined by the intensity of the force of the pull on the fishing line,
opposing means to exert a force to oppose the force of the fishing line on said movable means,
a plurality of contact means extending in the path of said movable means to close an electrical circuit when establishing contact with said movable means,
a plurality of lamps, each of said lamps in a circuit with one of said contact means,
a source of power for said lamps,
and means to extinguish one of said lamps when another of said lamps is lit.

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**4,422,259**

## A ELLIPTICAL SHAPED STREAMLINED FISHING ROD

**Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan**

**Filed Apr. 7, 1981, Ser. No. 251,762**
**Claims priority, application Japan, Apr. 25, 1980, 55-57604[U]; Nov. 27, 1980, 55-170731[U]; Nov. 27, 1980, 55-170732[U]**
**Int. Cl.³ A01K *87/00***
**U.S. Cl. 43—18.1** **3 Claims**

1. A fishing rod comprising first, second and third rods, said first rod being provided with a grip and tapering toward a fore end, said third rod interconnecting said first and second rods, said second rod being provided with a tip and a connection portion connected to the fore end of said third rod and tapering toward said tip, said first and third rods each having an ellipse-like cross-sectional shape which includes a major axis and a minor axis, a ratio of the major axis to the minor axis of said third rod being larger than that of said first rod; said tip at said second rod having a round-like cross-sectional shape; and said connecting portion having a cross-sectional shape which changes in cross section from an ellipse-like shape at a portion adjacent said third rod to a round-like shape.

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**4,422,260**

## BAIT HOLDER

**James D. Perrick, 9757 Copplestone Cir., Sandy, Utah 84092**

**Filed Sep. 14, 1981, Ser. No. 301,737**
**Int. Cl.³ A01K *83/02, 83/04, 83/06***
**U.S. Cl. 43—44.8** **6 Claims**

1. A bait holder comprising
a support frame having a pair of joined legs, at least one of said legs being movable into close side-by-side relationship with the other of said legs and being resiliently movable away from said side-by-side relationship;
a control member having a water reaction portion and a tab projecting from said water reaction portion, said tab having an elongate slot therethrough whereby said tab will slide over the legs at the joined ends thereof and will be held on said legs by movement of one leg away from the other leg; and
a fish hook carried by at least one leg at the end of said legs opposite the joined ends thereof.

4,422,261

## TOY CAPABLE OF PIVOTAL MOVEMENT ON A SUPPORT SURFACE

Michihiro Kozuka, and Masayuki Tonokura, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Jun. 30, 1982, Ser. No. 393,883
Int. Cl.³ A63H 11/10
U.S. Cl. 46—104 10 Claims

1. A toy which comprises:

an articulated body divided into a lower body section and an upper body section, said body having a front, left and right sides, and a back, said upper body section pivotable from side to side with respect to said lower body section about a longitudinal axis passing through said front and said back of said body;

motor means located in said body;

wheel means located in said lower body section and operatively connected to and driven by said motor means to propel said toy across a support surface;

moving means operatively associated with said motor means and capable of pivoting said upper body section from side to side with respect to said lower body section about said longitudinal axis in response to movement imparted to said moving means by said motor means;

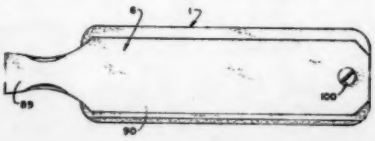
left and right upper body extension means extending from said upper body section toward said support surface and movable in combination with said upper body section in response to pivoting of said upper body section, said left upper body extension means contacting said support surface and said right upper body extension means lifting free from said support surface as said upper body section pivots to the left side and said right upper body extension means contacting said support surface and said left upper body extension means lifting free from said support surface as said upper body section pivots to the right side;

said toy pivoting about said left side upper body extension means when it contacts said surface as said wheel means propels said toy on said support surface and said toy pivoting about said right upper body extension means when it contacts said support surface as said wheel means propels said toy on said support surface.

4,422,262

## GAME CALL HAVING BLADES OF DIFFERING HEIGHT

Robert R. Moss, Rte. 2, Cole Camp, Mo. 65325

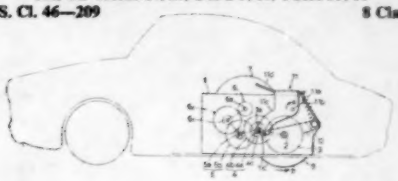
Filed Apr. 1, 1982, Ser. No. 364,441
Int. Cl.³ A63H 5/00
U.S. Cl. 46—189 10 Claims

1. In a game call of the striker and blade type including a base, the improvement comprising a a paddle-type striker attached to said base, said striker being pivotally mounted at one end and having a convex undersurface, a plurality of blades attached to said base, side by side but spaced from one another and extending generally in a common direction away from the pivot end of said striker, a first one of said blades being taller than a second, immediately adjacent blade, both of said blades being beveled in the same direction along their top edges, said edges being adapted to engage the convex undersurface of the striker sequentially as the striker is moved in one direction, but to remain at least momentarily in concurrent engagement therewith, said blades being constructed and arranged to produce sounds of different pitches.

4,422,263

## GEAR CHANGING MECHANISM FOR TOY VEHICLE DRIVING DEVICES

Hiroshi Masubuchi, Utsunomiya, Japan, assignor to Tonka Corporation, Hopkins, Minn.

Filed Sep. 14, 1978, Ser. No. 942,428
Claims priority, application Japan, Oct. 14, 1977, 52-138565
Int. Cl.³ A63H 29/20; F03G 3/08; F16H 35/00
U.S. Cl. 46—209 8 Claims



1. A toy vehicle power source including a flywheel secured on an axle; gear means interconnecting said flywheel to toy vehicle wheels, said gear means including a first gear path to interconnect said flywheel to wheels at one gear ratio when said vehicle is moved in one direction and a second gear path when said flywheel drives said wheels; and shifting means for changing said gear means from one path to the other path, said shifting means including an idler gear, said idler gear being shiftable from a position of non-engagement to a position of engagement in said first gear path, said idler gear being shiftable from a position of engagement in said first gear path to a position of non-engagement, said idler gear being shiftable from said position of non-engagement to a position of engagement in said second gear path and said idler gear being shiftable from a position of engagement in said second gear path to a position of non-engagement, said shifting means further including a second idler gear, said second idler gear being engagable in said first gear path by the lifting action of said first-mentioned idler gear when said first idler gear is being driven.

4,422,264

## SAFETY GATE ASSEMBLY

William S. Harris, Moravia, N.Y., assignor to Roly-Door Sales Company of Rochester, Inc., Rochester, N.Y.

Filed Sep. 29, 1982, Ser. No. 428,170
Int. Cl.³ E05F 17/00
U.S. Cl. 49—121 8 Claims

1. An assembly for controlling access to a pre-selected area comprising:

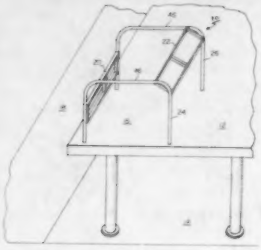
first and second generally U-shaped tracks disposed on first and second sides of said pre-selected area;

a first movable gate including means for engaging said tracks and for guiding said gate in said tracks between a raised and lowered position, said gate disposed generally on a third side of said pre-selected area;

a second movable gate including means engaging said tracks and movable between a raised and lowered position and disposed generally on a fourth side of said pre-selected area; and

means coupling said first and second gates for lowering said

first gate when said second gate is raised and vice versa for preventing said first and second gates from being raised



simultaneously, thereby controlling access to said preselected area.

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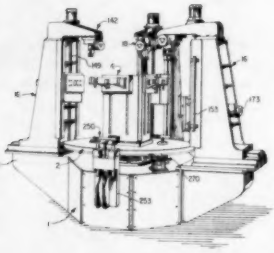
**4,422,265**

## MULTISTATION GRINDING MACHINE

**Keith Branston, Windsor, Canada, assignor to Jacobi-Branston Inc., Windsor, Canada**

**Filed Jun. 15, 1981, Ser. No. 273,779**
**Int. Cl.³ B23F *19/05***
**U.S. Cl. 51—52 R** **24 Claims**



**1.** A multi-station grinding machine comprising

a machine bed;

a worktable mounted on said machine bed to rotate thereon about a principal axis, said worktable comprising a plurality of workpiece holding means mounted thereon at equal angular intervals around said axis and uniformly spaced therefrom, each holding means defining parallel to said principal axis a support axis for a workpiece to be held therein;

a loading/unloading station and a plurality of work stations positioned around said bed, said stations being distributed about said principal axis at angular spacings corresponding to the angular intervals between said holding means, and each work station including machining means operative to effect material removal from a workpiece;

table index means operative between said table and said bed to effect angular indexing of said table about said principal axis through a series of registered positions in each of which one holding means has its support axis in precise register with said loading/unloading station and others of said holding means have their support axes in precise register with respective ones of said work stations, indexing of said table being effective to bring a workpiece successively into register with each of said work stations;

brake means selectively operable to lock said table when in a registered position and to release said table for rotation between registered positions;

individual workpiece index means positioned in said machine bed at each said work station in a fixed location radially of said principal axis and in axial alignment with a said holding means when the table is in a registered position, each said workpiece index means being independently operable to drive the associated holding means and effect predetermined incremental indexing rotation of a workpiece held therein to present preselected portions of the workpiece for engagement by the associated machining means; and

coupling means for forming a rigid rotary drive connection between each indexing means and the associated axially aligned holding means in the registered position of the table, said coupling means being selectively disengageable to permit rotation of the table between registered positions.

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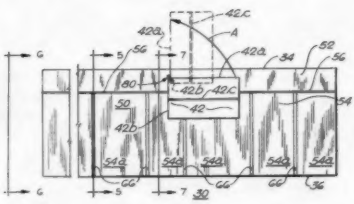
**4,422,266**

## BUILDING PANEL

**Donald H. Slocum, Villa Park, and James W. Eaton, Sleepy Hollow, both of Ill., assignors to Masonite Corporation, Chicago, Ill.**

**Filed May 3, 1982, Ser. No. 374,281**
**Int. Cl.³ E04D *1/00***
**U.S. Cl. 52—58** **14 Claims**



**1.** A building panel having inner and outer faces outlined by opposite ends and by upper and lower edges, said opposite ends of said panel adapted to closely face the end of an adjacent panel in the same course, said outer face having a lower portion of substantially larger surface area adapted for exposure and an upper portion of relatively smaller surface area adapted to underlie a lower portion of one or more of said panels positioned in a next higher course; and

a flashing element mounted on said panel for pivotal movement between a first position wherein said element lies entirely within the outline of the panel bounded by said opposite ends and said edges and a second position wherein said element extends outwardly across said outline for flashing a joint between adjacent panels.

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**4,422,267**

## GEODESIC DOME-TYPE BUILDING STRUCTURE

**Oliver D. Whitehouse, 9610 Frascatti Way, Santee, Calif. 92071**

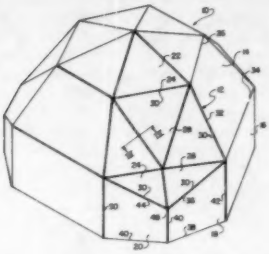
**Filed Aug. 13, 1981, Ser. No. 292,609**
**Int. Cl.² E04B *1/32***
**U.S. Cl. 52—81** **7 Claims**

**1.** A self supporting modular building shell structure comprising:

a peripheral vertical wall structure defined by rectangular panels separated by pairs of irregular guadrilateral panels, the base of said peripheral vertical wall defining an irregular nonagon;

a generally dome shaped roof defined by a single central equilateral hexagonal unit surrounded by alternate equilateral pentagonal and equilateral trapezoidal units support on said peripheral wall structure, wherein each trapezoid

roof panel is supported on top of a rectangular wall panel, and



said pentagonal roof units are each supported on a pair of quadrilateral units.

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**4,422,268**

## BARREL-VAULT ROOFING ELEMENT

**Dieter Mueller, Pfungstadt; Inge Löbig, Darmstadt, and Klaus Kerk, Griesheim, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany**

**Filed Apr. 13, 1981, Ser. No. 253,798**

**Claims priority, application Fed. Rep. of Germany, Apr. 18, 1980, 8010662[U]**

**Int. Cl.³ E04B *1/32***

**U.S. Cl. 52—86** **4 Claims**

1. A roofing member comprising at least one arch-shaped carrying rib, a cylindrically curved plastic sheet resting on the carrying rib; at least one nonextensible strap spanning said plastic sheet and having opposed ends, at least one of which is releasably secured to said rib, said at least one end of the strap having a releasable catch thereon slidably engaged with a catch connected to said rib, said catches overlapping by a dimension T in the direction of strap length; and at least one strip of soft flexible material positioned between the plastic sheet and either said strap or said carrying rib, the thickness of said strip being selected such that the strip is compressed by at least one third of the dimension T when said catches are engaged and the ends of the strap are attached to the rib thereby to tension the strap and hold the plastic sheet on the rib.

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**4,422,269**

## MASONRY PRODUCT

**Robert L. Giard, High Road, Gilbertville, Mass. 101031**

**Filed Apr. 17, 1981, Ser. No. 255,320**

**Int. Cl.² E04B *1/20***

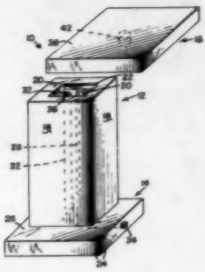
**U.S. Cl. 52—100** **10 Claims**

7. A masonry structure comprising:

(a) a concrete core which is rectangular in horizontal cross-section and having four surfaces, a flat horizontal top surface and a horizontal ledge extending about the lower periphery of said vertical surfaces,

(b) a vertical rib along each vertical corner of said vertical surfaces, that extends from the ledge to the top horizontal surface,

(c) a plurality of masonry elements supported on the ledge and covering the ledge and vertical surfaces of the core between said ribs, and



(d) a flat horizontal cover that rests on the top surface and overlies the masonry elements.

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**4,422,270**

## MODULAR, SELF SUPPORTING FLIGHT OF STAIRS

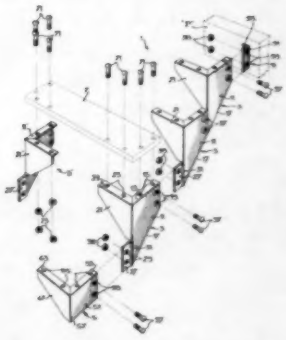
**Leopold Lapointe, Val David, and Donat Pelletier, St-Philippe, both of Canada, assignors to G.R.S. International Inc., Montreal, Canada**

**Filed Jan. 19, 1982, Ser. No. 340,891**

**Claims priority, application Canada, Jan. 21, 1981, 369021**

**Int. Cl.² E04F *11/00***

**U.S. Cl. 52—182** **15 Claims**



1. A stringer unit for the fabrication of a modular, self-supporting flight of stairs, said unit comprising:

a vertical side plate provided with an horizontal, upper flange;

a vertical front plate defining a rectangular dihedron with the side plate, said front plate being also provided with an horizontal, upper flange defining together with the upper flange of the side plate, a rigid L-shaped support very stable in use for supporting one end of a step thread; and

a small fixation plate integrally extending the side plate in the same plane as, or in a plane parallel to, the plane of said side plate, said fixation plate being so positioned as to come into contact with the surface of the side plate of another, upper or lower stringer unit, the surface of the fixation plate and the surface of the side plate of the unit with which the fixation plate of a further, upper or lower stringer unit comes into contact, being each provided with at least one punched hole positioned in such a manner as to be in front of a corresponding hole punched in the same direction through the surface of the fixation plate or the surface of the side plate of said further upper or lower

stringer unit for allowing riveting or bolting of said further unit to said unit, said punching of the holes ensuring some kind of engagement of the holes one inside the other during the riveting or bolting step and thus an improved reinforcement of the flight against the vertical shearing forces.

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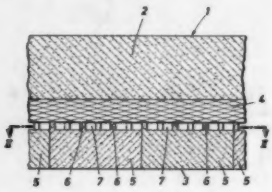
4,422,271

## DOUBLE-WALLED MASONRY

Hedwig Anzinger, Birkenstrasse 11, A-4600 Wels, Austria

Filed Apr. 23, 1981, Ser. No. 256,789
Claims priority, application Austria, Apr. 25, 1980, 2228/80
Int. Cl.³ E04B 1/74, 1/70
U.S. Cl. 52—302 3 Claims



1. Double-walled masonry comprising
(a) an inner supporting wall,
(b) an outer wall defining a free space with the inner wall, the outer wall being comprised of
(1) individual building blocks having perpendicularly extending ribs projecting into the free space and defining slots therebetween to constitute the free space, the ribs having an average width which is smaller than the average width of the slots, and
(c) an interior insulating layer between the inner supporting wall and the ribs, the ribs projecting to the insulating layer for holding the same in place and the slots permitting airing of the double-walled masonry.

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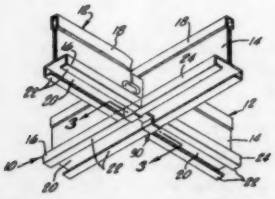
4,422,272

## COSMETIC COVER FOR CHANNELLED TYPE GRID SYSTEMS

Ormond Sutter, Placentia, Calif., assignor to Lok Products Company, Fullerton, Calif.

Filed Dec. 4, 1980, Ser. No. 212,982
Int. Cl.³ E04B 5/52
U.S. Cl. 52—311 2 Claims



1. A ceiling grid system comprising (a) a support member and (b) a pair of opposing transverse members intersecting with and abutting against the support member, the support member and transverse members each having a configuration comprising a vertical web and a lower support channel, each support channel comprising external vertical sidewalls and a downward facing groove having a downward facing interior wall of a first color, and downward facing flats on either side of the groove, the flats being of a second color, the first and second colors being different from each other, the grid system further comprising (c) means for connecting each transverse member to the support member, and (d) a resilient clip engaging the groove of the suport member and covering the flats of the support member at the location the support member is intersected by the transverse members, the clip comprising two exterior upwardly extending arms and an interior upward projection, the interior upward projection being sized to resiliently fit into the groove of the support member, each arm being spaced apart from the interior upward projection a distance about equal to the width of the flats so that the arms slide over the side walls of the support member when the clip is in position, the downwardly facing surface of the clip being of the first color so that the appearance of the two opposing transverse members in combination with the clip is that of a single continuous member.

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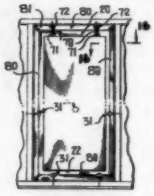
4,422,273

## THERMAL INSULATING SYSTEM PARTICULARLY ADAPTED FOR BUILDING CONSTRUCTION

Harrison G. Dyar, P.O. Box 185, Tampa, Fla. 33601

Division of Ser. No. 215,083, Dec. 10, 1980, Pat. No. 4,334,395.
This application May 3, 1982, Ser. No. 374,259
Int. Cl.³ E04B 1/78
U.S. Cl. 52—407 6 Claims



1. A system for insulating building walls, ceilings, floors or like structure comprising wall means for forming a hollow insulating panel defining an interior chamber under negative pressure, means contacting a limited exterior surface area of said panel for supporting said panel in generally spaced relationship from an associated building wall, ceiling, floor or like structure, means normally spaced from the exterior surface of said panel for contacting a limited exterior surface area of said panel only upon said first-mentioned contacting means becoming inoperative which would in the absence of said second-mentioned contacting means result in direct contact between said panel and the associated building wall, ceiling floor, or like structure, said second-mentioned contacting means being an elongated pin-like element of relatively small cross-sectional configuration whereby thermal conduction transfer therethrough is substantially negligible, said panel having a peripheral outline of a predetermined size and shape, and a peripheral skirt of flexible material bordering said panel peripheral outline and being adapted to span any space between the panel peripheral outline and the associated building wall, ceiling, floor or like structure.

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4,422,274

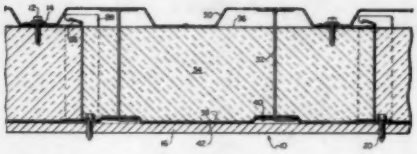
## INSULATED PANEL

William H. Holliday, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 215,017, Dec. 10, 1980, abandoned.
This application Nov. 19, 1982, Ser. No. 443,016
Int. Cl.³ E04B 5/00
U.S. Cl. 52—410 8 Claims

1. In a panel structure for insulating vessels, said panel structure including a plurality of surface panels, insulation material, means for fastening said surface panels to one another and means for fastening said panel structure to said vessel, the improvement wherein said surface panels have a side portion thereof fastened to a region adjacent to and inwardly spaced from the opposite side portion of an adjacent surface panel and wherein the opposite side portions of said surface panels are

fastened to said vessel by said means for fastening said panel structure to said vessel, said means for fastening said panel structure to said vessel comprising fastening clips, said fastening clips each having a grooved panel receiving portion and a nose portion extending into said panel receiving portion, said



panel receiving portion and said nose portion cooperating to snappingly receive said opposite side portions of said surface panels therebetween, said opposite side portions and said surface panels being reverse folded, to thereby firmly retain said surface panels while permitting thermal expansion and contraction of said surface panels.

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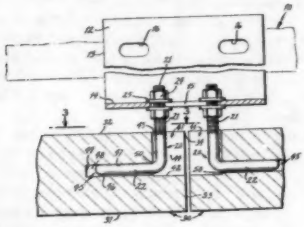
4,422,275

## ANCHOR POCKET SYSTEM FOR CUT STONE TRIM AND THE LIKE

Kenneth J. Baetje, St. Louis, Mo., assignor to Midwest Cut Stone Co., St. Louis, Mo.

Filed Nov. 18, 1981, Ser. No. 322,420
Int. Cl.³ E04B 1/38
U.S. Cl. 52—509 3 Claims



1. For use as building trim and the like, a cut stone to be supported in alignment with similar stones by a plurality of rod anchor bolts of the type having a threaded shank for bolting to a building structural member and a supporting end bent perpendicular to the shank, the stone having an outer surface to be exposed on erection and having, to be unexposed on erection, a back surface and a joint surface perpendicular thereto and meeting in a common edge, characterized in having, for each of such anchor bolts,

an anchor pocket in the common edge and including a sinkage and a cavity extending from the sinkage,

said sinkage being of an extent, measured inward from said common edge, at least two and a half times the thickness of such anchor bolt and, measured along said common edge, greater than three times said thickness, and of a depth measured from said back surface greater than three times said thickness,

the cavity having a floor and ceiling spaced from each other sufficiently to accommodate the thickness of such supporting end of the rod anchor bolt and having side walls which at the cavity mouth are spaced from each other more than twice such bolt thickness, and in which

the spacing of said cavity side walls from each other at the cavity mouth is less than the length of the supporting ends of such rod anchor bolts,

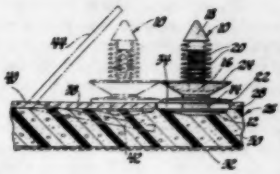
whereby on erection to permit adjustment of alignment of the cut stone with adjacent stones.

4,422,276

## DOOR TRIM FASTENER ASSEMBLY

Reno R. Paravano, St. Clair Shores, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 10, 1981, Ser. No. 291,570
Int. Cl.³ E04B 1/38
U.S. Cl. 52—511 3 Claims



1. A door trim fastener assembly, comprising, in combination,

a fastener having a head portion and a neck portion of smaller size than the head portion,

a trim panel including a planar backing layer and a resilient layer beneath the backing layer, the backing layer having a slot with a closed end and an open end through which the neck portion of the fastener is receivable and having a width less than the width of the head portion of the fastener,

the planar backing layer further including a flap hinged thereto of a width sufficient to receive the fastener head portion through the backing layer as the head portion moves the flap between a first position substantially coplanar with the backing layer and at least partially traversing the slot to block removal of the neck portion of the fastener from the slot and a second position resiliently compressed into the resilient layer as the fastener is moved substantially perpendicularly to the backing layer to allow insertion of the neck portion of the fastener through the open end of the slot, the flap moving back to first position under the resiliency of the resilient layer to retain the fastener.

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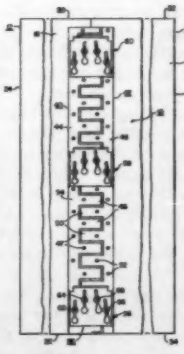
4,422,277

## PANEL JOINT

Gurdip S. Bains, Bethel Park, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 11, 1981, Ser. No. 262,370
Int. Cl.³ E04C 1/10
U.S. Cl. 52—584 1 Claim



1. A panel joint, comprising:

first and second adjoining, upstanding non-metallic wall

panel members having front and rear surfaces, and flat adjacent edges, with said flat adjacent edges being butted against one another, and with the front surfaces of the panels being in a common plane,

and joining means disposed adjacent to the rear surfaces of said first and second wall panel members, said joining means including first and second metallic alignment plates, a plurality of metallic spacer members, and a plurality of metallic plate members, said joining means holding said wall panel members tightly together to provide a tight joint between their front surfaces, devoid of visible joining means, while aligning the front surfaces in a common plane at the joint,

said first and second metallic alignment plates having first and second major, flat surfaces, said first and second alignment plates each having a back portion and a plurality of spaced finger portions which extend outwardly from a common side thereof, the first major flat surfaces of said back portions of the first and second alignment plates being fixed to the rear surfaces of said first and second wall panel members, respectively, along their adjacent edges, with their finger portions extending outwardly from the associated wall panel member to vertically interleave with one another and contact the rear surfce of the other wall panel member,

said plurality of metallic spacer members having head and shank portions, said spacer members being fixed in vertically spaced pairs to each of said first and second metallic alignment plates, with the spacer members of each pair being substantially horizontally spaced,

said plurality of metallic plate joining members each comprising a flat section having first and second major, flat, parallel opposed surfaces defining first, second third and fourth elongated slots which extend between the opposed surfaces, said first and second slots being disposed on one side of a vertically extending longitudinal axis of the joining member, and said third and fourth slots being disposed on the opposite side, said first and second slots each having sides which are parallel with the longitudinal axis, and said third and fourth slots each having sides which are parallel with one another, but slightly inclined relative to the longitudinal axis,

said plurality of joining members being disposed with their first surfaces in flat, surface-to-surface contact with the second major flat surfaces of said first and second alignment plates, with a pair of spacer members on said first alignment plate being captured by said first and second slots, and a pair of spacer members on said second alignment plate being captured by the third and fourth slots, to provide a plurality of vertically spaced joining assemblies, with the first and second alignment plates being common to all of said joining assemblies,

said plurality of joining members being in a downwardly displaced, frictional locking position, with the inclined third and fourth slots forcing the associated pair of spacer members on the second wall panel member towards the first wall panel member, to urge the adjoining flat edges of said first and second wall panel members tightly together,

at least certain of said spacer members including means which forces the first major, flat surfaces of the metallic joining members tightly against the second major, flat surfaces of said first and second metallic alignment plates, forcing the first surfaces of the first and second panel members into a common plane at the location of each joining assembly, and with the fifrst and second alignment plates, being common to all the spaced joining assemblies, promoting such alignment between the metallic joining members.

**4,422,278**

## PANEL FITTING DEVICE

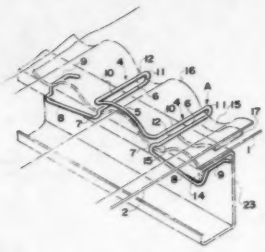
**Sanae Fujihiro, Yokohama, and Sigeyaki Matuda, Kasukabe, both of Japan, assignors to Toko Kogyo Co.Ltd., Japan**

**Filed Jun. 5, 1981, Ser. No. 270,891**

**Claims priority, application Japan, Aug. 22, 1980, 55-115749, 55-119210; Nov. 14, 1980; 55-162849; Dec. 20, 1980; 55-184039**

**Int. Cl.³ E04B 5/52**

**U.S. Cl. 52—714** **10 Claims**



1. A panel fitting device for fitting a corrugated panel to a framework member comprising:

a pair of spaced-apart substantially parallel panel-holding sections each comprising a main part and a pressing part connected to one end of said main part and defining a clearance space therewith for receiving an upper panel;

a supporting leg connected to each main part at an opposite end thereof, extending away from said clearance space;

a hitching part connected to each supporting leg at an end of each leg opposite to each respective main part, each hitching part extending substantially parallel to said holding sections and shaped to engage a framework member with a lower panel held between said main part and the framework member;

a panel pressing section connected between each pressing part of each holding section at an end of each pressing part opposite a connection between each pressing part and each main part, said panel pressing section being curved in a direction away from each clearance space for engagement around a corrugation of an upper corrugated panel to be fitted.

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**4,422,279**

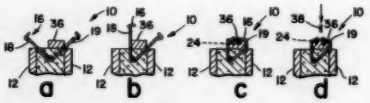
## METHOD FOR CONSTRUCTING A REINFORCED FOUNDATION

**John M. Powell, 5169 Alum Rock Ave. San Jose, Calif. 95127**

**Filed Sep. 4, 1981, Ser. No. 299,800**

**Int. Cl.³ E04B 1/00**

**U.S. Cl. 52—741** **7 Claims**




1. The method of constructing a reinforced foundation comprising the steps of:

(a) fabricating an open top form for a foundation wall of given length, height and thickness;

(b) fabricating a plurality of manually bendable elongated members having a length substantially greater than said given foundation wall thickness;

(c) bending each of said plurality of elongated members to define a pair of substantially rectilinear legs extending at an angle to each other with a spacing between the free

ends of said rectilinear legs greater than said given foundation wall thickness;

(d) placing said plurality of elongated members in spaced relation to each other across said open top of said form with said rectilinear legs extending into said open top of said form;

(e) placing an elongated reinforcing rod within said form with its long dimension extending along said given length in supported relation between said legs of each of said plurality of elongated members at a height less than said given height;

(f) filling said form with concrete to said given height whereby said reinforcing rod and adjacent portions of said legs of each of said plurality of elongated members are embedded in said concrete; and

(g) before said concrete has set, bending the one of said legs of each of said plurality of elongated members which is on the same given side of said given length up through said concrete to a given spacing from said other of said legs of each of said plurality of elongated members.

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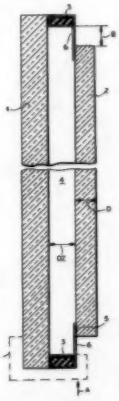
**4,422,280**

## INSULATING GLASS UNIT

**Dietrich Mertin, Witten; Paul Derner, and Wolf von Reis, both of Gelsenkirchen, all of Fed. Rep. of Germany, assignors to BFG Glassgroup, Paris, France**

**Filed Apr. 21, 1981, Ser. No. 255,994**
**Int. Cl.[2] E04C *2/54***
**U.S. Cl. 52—788** **10 Claims**



1. An insulating window unit with improved acoustic damping, comprising:

an inner glass pane;

an outer glass pane;

a spacer frame connected to said panes around the peripheries thereof and spacing said panes apart to define a gas-filled compartment between the panes; and

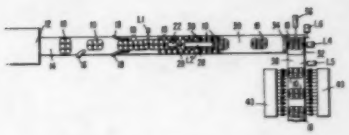
at least one membrane strip bonded to a face of one of said panes along an edge zone thereof and connected to said frame, said membrane strip being of a material and dimensioned to follow deformation of said edge zone without significant resistance thereto, said strip having a flexural stiffness substantially less than that of said one of said panes at least in the region of said edge zone, the bending resistance of said in said zone being by a factor of $10^{-2}$ to $10^{-6}$ less than that of said one of said panes whereby transverse oscillations of said one of said panes correspondingly deform said strip.

**4,422,281**

## CONTAINER PACKAGE AND ITS MANUFACTURE

**Jürgen G. Rensner, Philadelphia, Pa., assignor to Pepsi Co., Inc., Purchase, N.Y.**

**Continuation of Ser. No. 26,772, Apr. 3, 1979, Pat. No. 4,294,058, which is a continuation of Ser. No. 812,327, Jul. 1, 1977, abandoned, which is a division of Ser. No. 697,578, Jun. 18, 1976, Pat. No. 4,078,659. This application Oct. 3, 1980, Ser. No. 193,472**
**Int. Cl.[3] B65B *61/14***
**U.S. Cl. 53—134** **17 Claims**



1. Apparatus for attaching thermoplastic film handles to packages of articles wrapped in thermoplastic film comprising:

a source of thermoplastic ribbon-like handle film for forming successive handles each having handle end portions on opposite sides of a handle middle portion;

a support surface;

means for conveying packages of articles wrapped in thermoplastic wrap film on said support surface with said packages in end-to-end relationship;

means for positioning handle end portions of respective handles of the handle film from said source into contact with opposite non-supported side portions of the wrap films on each package of said packages on said support surface; said positioning means including means for positioning handle end portions into contact with adjacent side portions of each pair of adjacent packages of said packages,

means for tacking the handle end portions of said handle film to the side portions of the wrap films on each of said packages leaving the middle portions of the handle film free of any tacking on each of said packages;

means for severing said handle film between the resulting tacked portions of said handle film between each pair of said adjacent packages; and

heating means for heating said tacked handle end portions by hot gas or radiant energy to seal said handle end portions to the side portions of the wrap films of said packages leaving the middle portions of the handles free of any seal on each of said packages.

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**4,422,282**

## MACHINE FOR CLOSING THE UPPER FLAPS OF PARALLELEPIPEDAL CARTONS WITH FOLDABLE FLAPS

**Augusto Marchetti, Piazza Sicilia 7, 20146 Milano, Italy**

**Filed Jul. 27, 1981, Ser. No. 287,197**
**Claims priority, application Italy, Sep. 15, 1980, 22757/80[U]**
**Int. Cl.[3] B65B *7/20***
**U.S. Cl. 53—374** **8 Claims**

1. A machine for closing the upper flaps of parallelpipedal cartons with foldable flaps, the machine comprising:

a support plane for the cartons;

advancing means for advancing the cartons along said support plane and arranged thereabove along the path of advancement of the cartons;

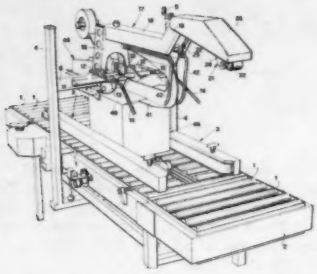
a first closing member capable of engaging the front end flap of the cartons to cause the folding thereof to a closed position;

said first closing member consisting of a pair of substantially vertical rods constantly inserted in the path of advancement of the front flap of the cartons;

a second closing member capable of engaging the rear end

flap of the cartons to cause the folding thereof to the closed position;

said second closing member consisting of a rotable shovel pivoted on one end of a rigid arm displaceable on command along a stationary guide having a box-like shape, said guide having a first horizontal section and a second upwardly sloping section, said rigid arm being formed by a succession of segments arranged at angles, the segment most distant from the connection end of said shovel being slidingly housed in said guide and being kept restingly in said upwardly sloping section of said guide, said rigid arm



being capable of rotary-translatory movement from said rest position which is displaced upward and backward with respect to the sense of advancement of the cartons to a lowered and advanced working position to engage from behind the rear flap of the cartons;

control means for causing said most distant segment of the rigid arm to slide towards and inside said horizontal section of said guide; and

urging means adapted to urge, by reaction, the rotation of said shovel from said rest position to said horizontal working position to fold said rear flap to the closed position during the end part of said movement of the arm.

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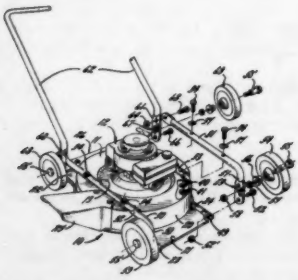
4,422,283

## LAWNMOWER WITH LONGITUDINAL SUPPORT FRAME

Joseph E. Scanland, Savannah, Ga., assignor to Roper Corporation, Kankakee, Ill.

Filed Dec. 28, 1981, Ser. No. 334,462
Int. Cl.[3] A01D *35/26, 67/00*
U.S. Cl. 56—320.2 11 Claims



1. A rotary lawn mower comprising, in combination, a mower deck including an inverted pan-shaped housing made of thin gauge metal having a horizontal top and a generally cylindrical side wall with a lower edge portion and defining a central space, a rotary power source mounted on the top of the housing and having a shaft extending into the central space, a blade mounted on the lower end of the shaft, the deck having pairs of front and rear corner positions, separately mounted left and right longitudinal frame members each having a central portion which extends bridgingly in horizontal position above the housing between respective front and rear corner positions, the frame members having downward extensions disposed adjacent said corner positions, wheels secured to the respective downward extensions, means for rigidly fastening the central portion of each frame member to the top of the mower housing, a handle extending rearwardly and upwardly from the mower deck for guiding the mower, and bracing means including rigid connections between each downward extension and the adjacent lower edge portion of the housing to minimize relative movement therebetween.

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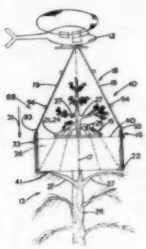
4,422,284

## APPARATUS AND METHOD FOR HARVESTING SEED BEARING CONES

Helmut E. Fandrich, 2461 Sunnyside Pl., Clearbrook, British Columbia, Canada V2T 4C4, and Fred Fandrich, Agassiz, Canada, assignors to Helmut Edward Fandrich, Clearbrook, Canada

Filed Apr. 11, 1980, Ser. No. 139,577
Int. Cl.[3] A01D *46/00*
U.S. Cl. 56—328 R 19 Claims



10. Apparatus for harvesting cones from a tree, the apparatus having a retrieving means and a holding means cooperating with the retrieving means so as to collect cone containing material retrieved from the tree, the retrieving means being characterized by:

(a) a lower portion having guide means adapted to encircle the tree and to permit generally axial movement of the retrieving means relative to trunk of the tree,

(b) an upper portion with an upper periphery having separating means to separate cone containing material from the tree resulting from relative movement between the retrieving means and the tree, the upper periphery having a plurality of recesses to receive portions of the tree therein, structure defining the recesses being stationary and non-rotationally mounted relative to the lower portion and to a central longitudinal axis of the apparatus, the recesses facing inwardly and having the separating means to separate the cone containing material from the tree upon generally axial movement of the retrieving means along the trunk with negligible rotational movement of the separating means,

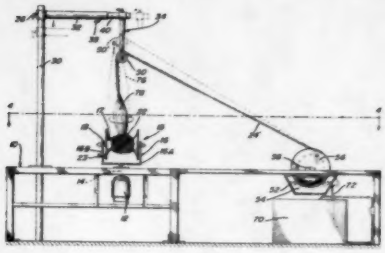
(c) each recess being defined by a pair of generally parallel straight side edges provided with generally upwardly extending knives, the side edges being spaced apart at a knife spacing to accept maximum thickness of the tree trunk at a lowermost position of the apparatus on the trunk, the knives providing the separating means.

4,422,285

## APPARATUS AND PROCESS FOR MAKING A FUR YARN

Gabriel Rol, 64 de Bretagne, St-Lambert Quebec, Canada

Filed Oct. 28, 1981, Ser. No. 316,031
Int. Cl.³ A41H 41/00; C14B 15/10; D02G 3/06
U.S. Cl. 57—31 12 Claims



1. An apparatus for making a fur yarn comprising: rotatable bobbin means having wound thereon a strand of animal fur consisting of a narrow elongated skin portion and of hair extending from one face of the skin portion; means drawing said strand from said bobbin means; means for rotating said bobbin means to impart a twist to said strand as it is drawn from said bobbin means; spring-biased support means located above said rotatable bobbin means receiving said strand being twisted; said drawing means including drum means receiving thereon said twisted strand downstream of said support means and means for rotating said drum means; and means for wetting said twisted strand on said drum means to allow said strand to maintain its twisted shape and to form a fur yarn.

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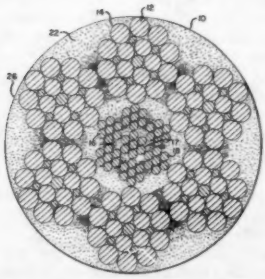
4,422,286

## FIBER REINFORCED PLASTIC IMPREGNATED WIRE ROPE

Neville H. Simpson, Kenosha, Wis.; Peter P. Riggs, Ballaugh Glen, Isle of Man, and Warren W. Rasmussen, Geneva, Ill., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Feb. 8, 1982, Ser. No. 346,949
Int. Cl.³ D07B 1/00, 1/14
U.S. Cl. 57—221 28 Claims



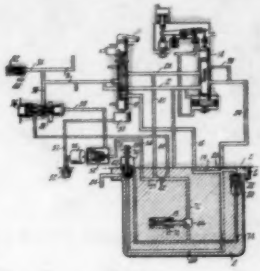
1. A method of making a wire rope comprising the steps of: winding individual wires into strands; forming a plurality of outer strands about a lubricated core into a multistrand rope while coating the outer strands with a lubricant; and impregnating the rope with a coating reinforced with discontinuous predispersed fibers, said coating extending between said core and said outer strands and between said outer strands.

4,422,287

## FUEL CONTROL FOR GAS TURBINE ENGINES

Charles F. Stearns, East Longmeadow, Mass., and Herbert W. Tutherly, Windsor, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 29, 1980, Ser. No. 191,548
Int. Cl.³ F02C 9/28
U.S. Cl. 60—39.281 3 Claims



1. A fuel control adapted for different gas turbine engine configurations including:
a main control housing having an interface thereon;
a throttle valve in said housing;
said housing having inlet and outlet passages for said throttle valve said outlet passage terminating at the interface;
a condition responsive valve in said housing;
said housing having an inlet passage from the throttle valve to said condition responsive valve and an outlet passage from said condition responsive valve to the interface;
a pressure regulating valve in said housing for maintaining the pressure drop across the throttle valve;
said housing having a first passage and a second passage comprised of a series of passages from the inlet and outlet passages respectively of the throttle valve to said pressure regulating valve;
said housing having another fluid passage from the throttle valve to said interface;
an adapter block removably attached to said housing at said interface, said block having a cooperating interface;
control means in said block to affect the flow of fuel to the engine;
said block having a fuel passage having its inlet at said interface to mate with the outlet passage from the condition responsive valve and an outlet in said block spaced from the interface for connection to the engine;
said block having a branch passage from said fuel passage to the interface to mate with the outlet passage from the throttle valve to the interface;
pressure responsive means in said fuel passage in the block and responsive to said control means; and
said block having another fluid passage from the interface through the control means to the pressure responsive means, said another fluid passage in said block having its inlet end at the interface to mate with said another fluid passage in said housing.

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4,422,288

## AFT MOUNTING SYSTEM FOR COMBUSTION TRANSITION DUCT MEMBERS

Charles E. Steber, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,437
Int. Cl.³ F02C 7/20
U.S. Cl. 60—39.32 18 Claims

1. A support system for attaching the aft end of a gas turbine

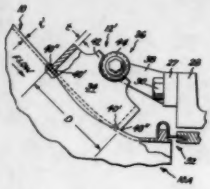
combustion transition duct member to a functionally related structural member comprising:

(a) a cylindrical shaped base member contoured to mate with the surface of said transition duct member and rigidly attached thereto;

(b) a pivoting hinge assembly comprising:

(i) boss means rigidly attached to said base member;

(ii) a bracket having a first end adapted to be nested with said boss means and to be nested with said boss means and a



second end adapted to be attached to said functionally related structural member;

(iii) interconnecting means fitted through said boss and said bracket for retaining said boss means and said bracket in close cooperating relationship, and providing a pivot axis for enabling pivotal relative motion therebetween; and

(iv) said interconnecting means being configured to apply a predetermined force between said boss means and said bracket to resist, in controlled part, said pivotal relative motion.

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**4,422,289**

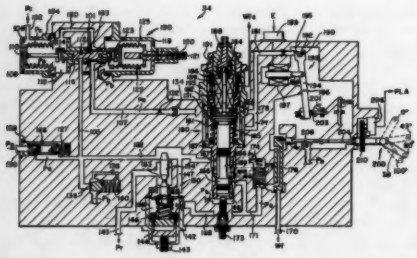
## FUEL CONTROL APPARATUS FOR A GAS TURBINE ENGINE

**Roy Langton, Simsbury, Conn., assignor to Aviation Electric Ltd., Montreal, Canada**

**Filed May 12, 1981, Ser. No. 262,868**

**Int. Cl.³ F02C *9/28***

**U.S. Cl. 60—39.281** **14 Claims**



1. In a fuel control system for a gas turbine engine having an electronic governor which generates an electrical signal indicative of a desired fuel/air ratio of the engine, a fuel control apparatus comprising:

a metering valve having a position proportional to the fuel flow therethrough, said metering valve being positioned in response to a hydraulic control pressure;

means for generating said hydraulic control pressure proportional to the pneumatic discharge pressure of the compressor of the engine; and

means for modulating said control pressure in response to said electrical signal by regulating the area of a control orifice communicating with said control pressure.

**4,422,290**

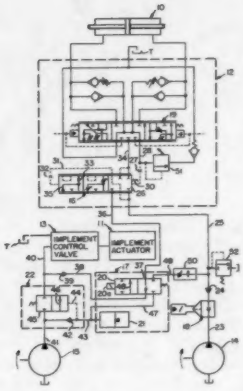
## HYDRAULIC CONTROL SYSTEM FOR GOVERNING STEERING AND IMPLEMENT ACTUATORS

**Theron M. Huffman, Paw Paw, Mich., assignor to General Signal, Stamford, Conn.**

**Filed Aug. 26, 1981, Ser. No. 296,282**

**Int. Cl.³ F15B *13/06, 13/09, 20/00***

**U.S. Cl. 60—404** **3 Claims**




1. A hydraulic control system for governing steering and implement actuators comprising steering control means and implement control means having steering and implement pump means respectively for selectively operating the steering and implement actuators, pressure compensating means for delivering excess fluid pressure from the steering control means to the implement control means, and emergency fluid pressure supply means for the steering control means, wherein improved emergency fluid pressure supply means comprises;

(a) steering control means for supplying fluid to the steering actuator from the steering pump wherein output of the steering pump is delivered successsively through a pressure sensing switch, a check valve, a pressure compensating valve for delivering excess fluid pressure from the steering control means to the implement control means and a direction control means,

(b) emergency steering control means comprising;

(1) accumulator means connected through a check valve to an output supply passage of the implement pump to give charging of the accumulator means preference over pressurization of the implement actuator,

(2) emergency control valve means having a solenoid control subject to energization by the pressure switch when the pressure switch senses loss of pressure in the output of the steering pump,

(3) emergency control means responsive to actuation of the emergency control valve means upon energization of the solenoid for connecting output of the accumulator to input of the pressure compensating means through a pressure compensated flow control valve for pressurizing the steering control means from the implement pump, and

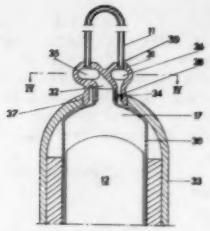
(4) the emergency control valve being effective to prevent flow from the pressure compensating means to the implement control means as long as the solenoid remains energized.

4,422,291

## HOT GAS ENGINE HEATER HEAD

John O. Berntell, Staffanstorp, Sweden, assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Oct. 5, 1981, Ser. No. 308,249
Int. Cl.³ F02G 1/04
U.S. Cl. 60—517 7 Claims



1. A hot gas engine heater head in which an oscillating flow of gaseous working medium is heated and circulated between a cylinder and a regenerator cavity surrounding said cylinder, said heater head comprising:

a plurality of tubes, each being connected at one end to a first manifold providing entrance to said cylinder and at the other end to a second manifold providing entrance to said regenerator cavity;

said first manifold being connected to said cylinder top via a central duct;

said second manifold being connected with said regenerator cavity via a second duct surrounding said central duct and having an annular cross section.

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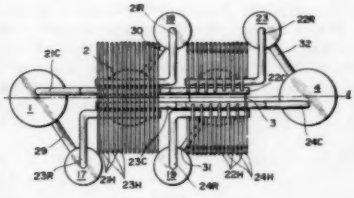
4,422,292

## CLOSED CYCLE IN-LINE DOUBLE-ACTING HOT GAS ENGINE

Yasunari Hoshino, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 8, 1981, Ser. No. 271,124
Claims priority, application Japan, Jun. 9, 1980, 55-76624; Jun. 30, 1980, 55-87719; Sep. 5, 1980, 55-122344
Int. Cl.³ F02G 1/04
U.S. Cl. 60—525 7 Claims



1. A closed cycle in-line double-acting hot gas engine, which comprises:

(a) four cylinders arranged in a straight line in the order of the first cylinder, the second cylinder, the third cylinder, and the fourth cylinder, said cylinders being operated in the order of the first cylinder, the third cylinder, the fourth cylinder, and the second cylinder;

(b) four regenerator/coolers arranged independently and symmetrically with respect to the cylinder line, the first regenerator/cooler, and the third regenerator/cooler being arranged on one side, the second regenerator/cooler and the fourth regenerator/cooler being arranged on the other side, said respective regenerator/coolers being connected to the respective compression spaces of said cylinders; and

(c) four heaters arranged symmetrically with respect to the cylinder line, the first heater being connected between the first cylinder and the second regenerator/cooler, the second heater being connected between the second cylinder and the fourth regenerator/cooler, the fourth heater being connected between the fourth cylinder and the third regenerator/cooler, and the third heater being connected between the third cylinder and the first regenerator/cooler, said first heater and said third heater being both gathered so as to form a single cylindrical heat exchanger in such a way that a plurality of parallel arranged circular U-shaped heater tubes of said first heater and a plurality of parallel arranged circular U-shaped heater tubes of said third heater are disposed alternately as one group, and said second heater and said fourth heater being both gathered so as to form a single heat exchanger in such a way that a plurality of parallel arranged circular U-shaped heater tubes of said second heater and a plurality of parallel arranged circular U-shaped heater tubes of said fourth heater are disposed alternately as the other group, said two heaters being disposed over said cylinders horizontally and symmetrically with respect to the center line of said two cylindrical heaters.

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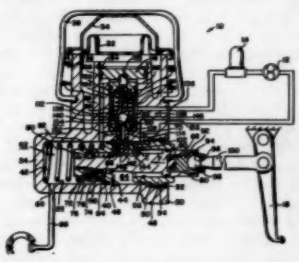
4,422,293

## CLOSED-CENTER HYDRAULIC SERVO APPARATUS

Jerome T. Ewald, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 12, 1981, Ser. No. 273,148
Int. Cl.³ B60T 13/00
U.S. Cl. 60—547.1 6 Claims



1. A closed-center hydraulic servo apparatus comprising a housing defining a pair of intersecting bores therein, a partition member movably received in one of said pair of bores and sealingly cooperating with said housing to substantially bound a variable-volume pressure chamber, an inlet communicating pressurized fluid from a source thereof into the other of said pair of bores, an outlet communicating a reservoir with said one bore, a passage opening on said one bore to communicate said pressure chamber and said other bore, valve means received in said other bore for in a first position closing fluid communication from said inlet to said pressure chamber, said valve means shifting to a second position to communicate pressurized fluid from said inlet to said pressure chamber, said valve means including a valve plunger extending from said other bore into said one bore, axial movement of said valve plunger shifting said valve means between said first and second positions, an input member reciprocably received in said one bore, said input member movably cooperating with said valve plunger to axially move the latter in said other bore in response to reciprocation of the former in said one bore, said partition member defining a socket leading to said pressure chamber, said socket movably and sealingly receiving a portion of said input member and said portion of said input member defining a first reaction area for opposing an operator input force applied

to said input member, said valve plunger being exposed to the fluid pressure within said pressure chamber via said other bore and said valve plunger being exposed to said reservoir via said one bore to define a second reaction area for opposing said operator input force.

2. A closed-center hydraulic brake booster comprising:

a housing defining a first bore therein;

a partition member reciprocably and sealingly received in said first bore, said housing carrying an abutment member engageable by said partition member to define a nonbraking position for the latter, said partition member defining a socket communicating axially therethrough;

an input member sealingly and reciprocably received in said first bore and in said socket, said partition member and said input member cooperating with said housing to bound an outlet chamber therewithin, said outlet chamber communicating with a fluid reservoir via an outlet, said partition member coupling for movement in unison with said input member via a lost motion connection and cooperating with said housing to bound a pressure chamber;

first resilient means for yieldably biasing said input member to an axially extended position relative said partition member, said lost motion connection defining a nonbraking position for said input member;

said housing defining a second bore mutually perpendicular to and intersecting said first bore, said second bore including a small diameter portion opening to said outlet chamber and cooperating with the remainder of said second bore to define a step thereon;

a valve plunger reciprocably and sealingly received in said small diameter bore portion and extending into said first bore;

an annular valve disc sealingly received in said second bore and engaging said step;

a bushing member sealingly received in said second bore and defining a pocket opening toward said valve disc;

a valve stem reciprocably received in said second bore and sealingly received in said pocket, said valve stem carrying a valve ball sealingly engageable with said valve disc;

second resilient means for yieldably biasing said valve stem toward said valve disc so that said valve ball engages said valve disc to define a first position for said valve stem; said valve disc, valve ball, bushing member and valve stem cooperating with said housing to bound an inlet chamber therewithin, said valve disc and valve plunger cooperating with said housing to bound a cavity therewithin;

an inlet communicating pressurized fluid from a source thereof into said inlet chamber, and a passage communicating said cavity with said pocket, said passage opening on said first bore immediately adjacent said partition member to communicate said cavity with said pressure chamber;

said valve plunger extending into said cavity and defining an annular varying surface sealingly engageable with said valve ball, a duct extending through said valve plunger from within said annular valving surface to said outlet chamber;

third resilient means for yieldably biasing said valve plunger toward said input member,

said valve plunger and said input member defining coacting means for reciprocating the former in response to reciprocation of the latter;

said coacting means opposing said third resilient means to support said valve plunger in a first position spacing said valving surface from said valve ball when said input member is in its nonbraking position to communicate said cavity to said outlet chamber via said duct;

said input member moving within said housing to a first braking position in response to an operator input force to sequentially shift said valve plunger to a second position sealingly engaging said valving surface with said valve ball and to a third position moving said valve ball from its first position to a second position spaced from said valve disc to communicate pressurized fluid to said cavity, said passage communicating pressurized fluid to said pressure chamber;

said input member further moving to a third braking position coupling for movement with said partition member via said lost motion coupling, said input member moving said partition member across said passage opening to interrupt fluid communication between said pressure chamber and said cavity.

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**4,422,294**

## HYDRAULIC ACTUATING AND LOCKING DEVICE

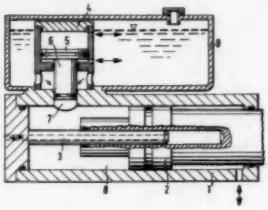
**Heinz H. Klein, Rossbach, Fed. Rep. of Germany, assignor to Dr. Boy GmbH, Fernthal, Fed. Rep. of Germany**

**Continuation of Ser. No. 64,747, Aug. 8, 1979, abandoned. This application Apr. 16, 1981, Ser. No. 254,594**

**Claims priority, application Fed. Rep. of Germany, Aug. 9, 1978, 2834895**

**Int. Cl.³ B60T *17/00***

**U.S. Cl. 60—565** **6 Claims**



1. An hydraulic actuating and locking device including a locking piston, a first cylinder, said locking piston mounted within said first cylinder for movement along the axis of the same between a first and a locking position, said locking piston having a rear surface, a space behind said locking piston within the confines of said first cylinder, a second cylinder formed in said rear surface of said locking piston, an actuating piston mounted to said first cylinder sealingly received into said second cylinder, an oil reservoir, a passage through the wall of said first cylinder disposed at an angle relative to said axis communicating the oil in said oil reservoir to said space, a pressure multiplier disposed in said oil reservoir including a high pressure piston movable into and out of said passage, means communicating said second cylinder to a source of pressure whereby upon pressurization of said second cylinder said locking piston moves relative to said actuating piston to said locking position and during movement oil is sucked into said space behind said locking piston, and said high pressure piston of said pressure multiplier upon movement into said passage sealing said passage and pressurizing said space to lock said locking piston in said locking position.

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**4,422,295**

## LUBRICATING SYSTEM FOR TURBO-CHARGERS

**Shunji Minami, Fukuroi, and Hiroshi Kimura, Iwata, both of Japan, assignors to Yamaha Motor Co., Ltd., Japan**

**Filed Oct. 1, 1981, Ser. No. 307,645**

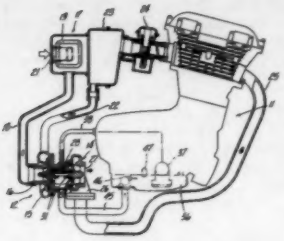
**Claims priority, application Japan, Oct. 31, 1980, 55-153479**

**Int. Cl.³ F01M *1/08***

**U.S. Cl. 60—605** **8 Claims**

1. In a lubricating system for the supercharger of an internal combustion engine including a supercharger drive shaft supported by bearing means and a lubricating system including a sump for delivering oil to said bearing means when the engine is running, the improvement comprising means defining a generally open fluid conduit extending between said sump and said bearing means, said bearing means being positioned rela-

tive to the normal oil level in said sump so that said bearing means are at or below said normal oil level for return of oil to



said bearing means through said fluid conduit when the engine is stopped.

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**4,422,296**

## INTERNAL COMBUSTION ENGINE WITH SUPERCHARGING BY EXHAUST GAS TURBOCHARGERS AND AN AUXILIARY COMBUSTION CHAMBER

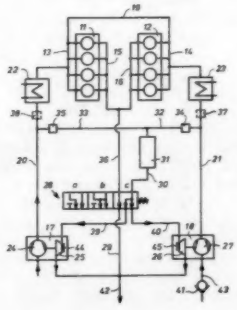
**Hans Dinger, Friedrichshafen, and Helmut Klotz, Tettnang, both of Fed. Rep. of Germany, assignors to MTU-Motoren- und Turbinen-Union Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany**

**Filed Aug. 4, 1981, Ser. No. 289,839**

**Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3043876**

**Int. Cl.³ F02B *37/00***

**U.S. Cl. 60—606** **15 Claims**



1. An internal combustion engine with supercharging by exhaust gas turbocharger means having turbine and compressor means and with an auxiliary combustion chamber means whose exhaust gases are temporarily fed to the turbine means of the exhaust gas turbocharger means for improving the acceleration characteristics of the engine, characterized in that at least two exhaust gas turbocharger means operating in parallel are provided, each including a turbine means and a compressor means, and means during acceleration of the engine for enabling the exhaust gases of the internal combustion engine to bypass the turbine means of the at least two exhaust gas turbocharger means and for feeding the exhaust gases from the auxiliary combustion chamber means to the turbine means of the at least two exhaust gas turbocharger means so that the exhaust gases of the auxiliary combustion chamber means alone effect drive of the at least two turbocharger means during such acceleration.

**4,422,297**

## PROCESS FOR CONVERTING HEAT TO MECHANICAL POWER WITH THE USE OF A FLUIDS MIXTURE AS THE WORKING FLUID

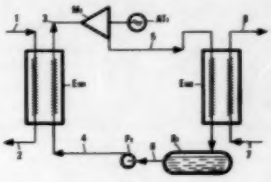
**Alexandre Rojey, Garches, France, assignor to Institut Francais du Petrole, Rueil-Malmison, France**

**Filed May 22, 1981, Ser. No. 266,569**

**Claims priority, application France, May 23, 1980, 80 11649**

**Int. Cl.³ F01K *25/06***

**U.S. Cl. 60—651** **12 Claims**



1. A process for producing mechanical power, comprising (a) progressively vaporizing at least one portion of a fluids mixture (M) comprising at least two constituents which do not form an azeotrope in the vaporization conditions, by recovering vaporization heat at least partly from an external fluid I whose temperature varies in a temperature interval A' during the exchange, the temperature of the mixture varying in a temperature interval A defined as the interval between the bubble point ($T_{LB}$) of the liquid and the dew point of the vapor ($T_{VR}$) during said vaporizing step, (b) expanding the resultant vapor phase to produce mechanical power, (c) progressively condensing, in a temperature interval B defined as the interval between the dew point of the vapor and the bubble point of the liquid during the condensing step, the resultant vapor while delivering heat to at least one external fluid II whose temperature varies in a temperature interval B', the width of the temperature interval B being at least 7° C. and at most 30° C., and (d) recycling to step (a) the liquid phase from step (c), the heat exchanges effected with the external fluids I and II in the steps (a) and (c) respectively being operated counter-currently, the mixture of fluids vaporizing in step (a) according to an increasing temperature evolution parallel to the decreasing temperature evolution of the external fluid I and condensing in step (c) according to a decreasing temperature evolution parallel to the increasing temperature evolution of the external fluid II.

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**4,422,298**

## LIQUEFIED NATURAL GAS-FREON ELECTRICITY GENERATION SYSTEM

**Reikichi Nozawa, To-7-204 Tamagawa Jyutaku, 3-1-71, Somechi, Chohfu-shi, Tokyo, Japan**

**Division of Ser. No. 973,735, Dec. 28, 1975, Pat. No. 4,330,998. This application Oct. 13, 1981, Ser. No. 315,581**

**Claims priority, application Japan, Dec. 29, 1977, 52/159500**

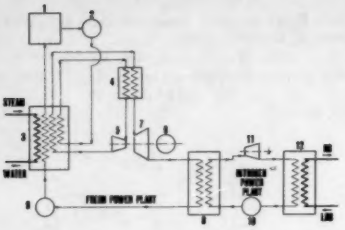
**The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.**

**Int. Cl.³ F01K *23/04***

**U.S. Cl. 60—655** **13 Claims**

1. A method for generating power utilizing a refrigerant as the working fluid and for limiting the temperature of the working fluid below its decomposition range of temperature, the method including steps of circulating the working fluid in a closed circuit through a storage tank, a compressor, heating means, a high pressure gas turbine, reheating means, a low pressure gas turbine, a condensing means, a pump, and a heater, characterized in that the temperature of the working

fluid in the circuit is maintained below the temperature of its substantial decomposition and in that a temperature below the



critical temperature of the working fluid is maintained at the outlet of said high pressure gas turbine.

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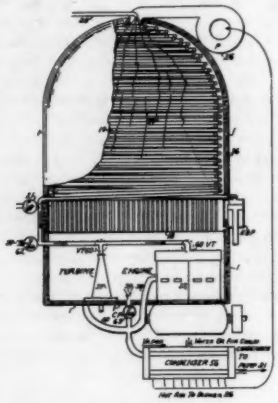
**4,422,299**
**FLASH SYSTEM POWER GENERATOR**
**George C. Sorensen, 589 SE. 4th St., Ontario, Oreg. 97914**
**Continuation-in-part of Ser. No. 76,435, Sep. 17, 1979, abandoned. This application Jan. 8, 1981, Ser. No. 223,417**
**Int. Cl.³ F01K *19/00***
**U.S. Cl. 60—681** **2 Claims**



1. A safety self-cleaning flash system power generator consisting of; a plenum chamber, a combustor situated in the upper portion of said plenum chamber, said combustor having a blower for providing pressurized air and means for supplying fuel for combustion with the pressurized air, a low pressure pump for circulating a working fluid, a low pressure heat exchanger situated in the lower portion of said plenum chamber in heat exchange communication with the combustion gases from said combustor, said low pressure pump circulating the working fluid through said low pressure heat exchanger, a high pressure pump in fluid communication with said low pressure heat exchanger for pressurizing the working fluid which has been heated to near its boiling point in said low pressure heat exchanger, said pressurized working fluid being introduced to a high pressure heat exchanger, said high pressure heat exchanger leading said pressurized working fluid in an upward path towards said combustor, said high pressure heat exchanger consisting of at least a single high pressure tube which upon reaching the upper end of said plenum chamber proceeds in a winding downward path causing said working fluid to continuously clean said high pressure heat exchanger, said working fluid being flashed by means of a throttle valve upon reaching the end of said winding downward path, an engine situated in the lower portion of said plenum chamber receiving said flashed working fluid to generate power and exhausting said working fluid to a condenser, said condenser also receiving the combustion gases from said combustor so that the combustion gases and exhausted working fluid are condensed for recirculation to the low pressure pump.

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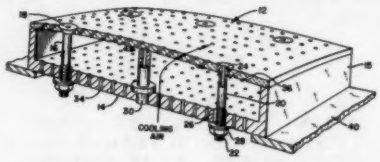
**4,422,300**
**PRESTRESSED COMBUSTOR LINER FOR GAS TURBINE ENGINE**
**James A. Dierberger, Hebron; William Ackermann, East Hartford, and Arthur D. Fine, West Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.**
**Filed Dec. 14, 1981, Ser. No. 330,759**
**Int. Cl.³ F02C *7/12***
**U.S. Cl. 60—757** **3 Claims**



1. A combustor having a liner formed from a plurality of segments supported on a frame in an axial and circumferential direction defining an annularly shaped combustion chamber, each frame being a relatively open ended box-like member having radially extending side walls complimenting the shape of its cooperating segment so that the side edge of each segment is contiguous with the top surface of said side walls, means for affixing said segments to the frame and for supporting said segments so that each are prestressed to bear against the top surface of said side walls, whereby said segment distorts when said combustor is operating at its normal temperature level and is in a relatively free stress condition, and means for cooling said segments to its operating temperature.

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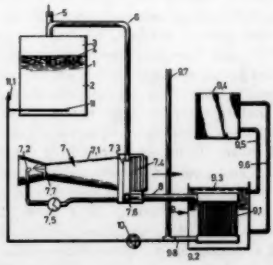
**4,4'2,301**
**EVAPORATIVE LOSS REDUCTION**
**Robert H. Watt, 3 River Rd., Rivonia, Transvaal, South Africa; Richard H. Ladd, Transvaal, South Africa, and Walter S. Wright, deceased, late of Happy Venture, Portion 30, Farm Stryfontein, 4771 R, Dist. Vereeniging, South Africa by Albert C. Fleischack, administrator, assignors to Robert H. Watt, Transvaal; William F. Hastie, Umkomaas and Walter Stockdale Wright, Vereeniging, all of, South Africa**
**Filed May 7, 1980, Ser. No. 147,688**
**Int. Cl.³ F17C *13/00***
**U.S. Cl. 62—54** **8 Claims**



1. A process for recovering a vapour contained with air in a space above a volatile liquid stored in a container comprising

causing a predetermined pressure above ambient air to be generated in the space, leading the vapour and any admixed air to a region for extraction of heat from the vapour, extracting heat from the vapour sufficiently to condense it at least partially at a pressure which is less than the pressure in the region for extraction of heat, transferring condensed liquid to a store and venting any uncondensed vapour together with any admixed air to ambient air, in which for the extraction of heat from the vapour at least as a first stage, a venturi evaporative cooling process is operated to provide a cooling medium to extract heat from the vapour.

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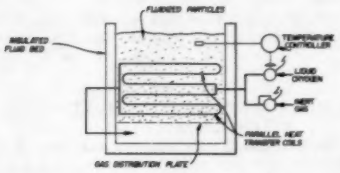
**4,422,302**

## PROCESS FOR COOLING AND FLUIDIZING

**Robert B. Davis, Nyack, and Mark A. Delano, White Plains, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.**

**Filed Aug. 3, 1982, Ser. No. 404,762**
**Int. Cl.³ F25D *17/00***
**U.S. Cl. 62—57** **2 Claims**




1. In a process for cooling and fluidizing a bed of particles by passing a cryogen through the bed, said bed being first cooled to a desired operating temperature, the improvement comprising:

(a) admixing a liquid cryogen and an inert gas, said gas being at ambient temperature, at a point external, but proximate, to the bed to provide a mixture of liquid cryogen and gas at a temperature sufficiently low to maintain the bed at about the desired operating temperature;

(b) introducing the mixture from step (a) into at least two heat transfer coils connected in parallel and located in the bed whereby the desired operating temperature is imparted to the bed, and the liquid cryogen in the mixture vaporizes; and

(c) removing the mixture of vaporized liquid cryogen and gas formed in step (b) from the coils and introducing the mixture into the bed to fluidize the bed.

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**4,422,303**

## PROCESS FOR COOLING A CONTINUOUSLY MOVING MATERIAL TO A PREDETERMINED TEMPERATURE

**Douglas H. Rothenberg, Shaker Heights, and Ronald L. Nicholson, Brunswick, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio**

**Filed Jun. 25, 1982, Ser. No. 392,406**
**Int. Cl.³ F25D *13/06***
**U.S. Cl. 62—63** **9 Claims**

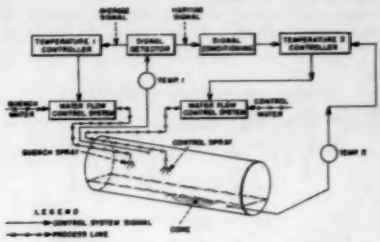
1. A continuous process for cooling a material to a predetermined temperature comprising continuously conveying said material along a travel path having an upstream portion and a downstream portion, the process comprising

(a) contacting the material in the upstream portion of said travel path with a first amount of a cooling fluid at a predetermined flowrate to at least partially cool said material,

(b) continuously measuring the temperature of the cooling fluid after it contacts said material,

(c) contacting the material in the downstream portion of said travel path with an additional amount of a cooling fluid to further cool said material, and

(d) adjusting the flowrate of said additional cooling fluid in response to said measured temperature so that said material is cooled approximately to said predetermined temperature.

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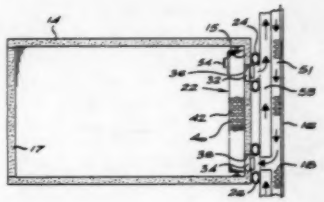
**4,422,304**

## TRANSPORTATION OF PERISHABLE PRODUCTS

**Brian W. Kuttel, Capetown, South Africa, assignor to TransFRESH Corporation, Salinas, Calif.**

**Division of Ser. No. 213,004, Dec. 4, 1980, Pat. No. 4,356,702.**
**This application Aug. 9, 1982, Ser. No. 406,631**
**Claims priority, application South Africa, Dec. 10, 1979, 79/6691; Jun. 26, 1980, 80/3803; Nov. 6, 1980, 80/6855**
**Int. Cl.³ F24F *3/16***
**U.S. Cl. 62—78** **8 Claims**




1. A sealed and insulated container adapted for the transportation of perishable food products inside said container on conveyance means having a source supplying a temperature-modifying fluid at a predetermined temperature for entry into said container from its exterior, said container having an aperture for the entry from the exterior of said temperature-modifying fluid at a predetermined temperature and an aperture for its discharge, said container including a heat exchange unit in which said temperature-modifying fluid is adapted to circulate and to undergo heat exchange with a second fluid comprising a modified atmosphere suitable for direct contact with, and for preservation of at least one perishable food product inside said container, said second fluid being sealed in the container and maintained separate from said temperature-modifying fluid.

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**4,422,305**

## COLD STORAGE ELEMENT, MOUNTING ASSEMBLY AND AIR CONTROL SLATS THEREFOR

**Peter V. Grosskopf, Am Ruhrstein 25, 4300 Essen 1, Fed. Rep. of Germany**

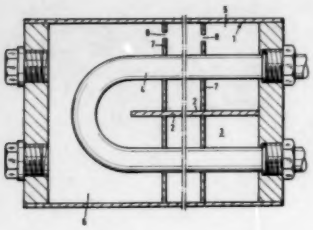
**Filed Apr. 1, 1982, Ser. No. 364,355**
**Int. Cl.³ F25D *11/00***
**U.S. Cl. 62—430** **9 Claims**

1. In an element for cold storage in a vehicle, the element having at least one container for an eutectic brine and a refrigerant-conducting pipeline passing therethrough for bringing

the eutectic brine to a temperature for the cold storage, the improvement to the element comprising:

a plastic shell (1) of rectangular cross section for forming the container for the brine;

a longitudinal web (2) interconnecting opposite side walls inside the plastic shell (1) for dividing the plastic shell (1)



into upper and lower compartments (5,6) in the orientation of the plastic shell (1) in the vehicle in use; and

a hair-pin turn in one end of the refrigerant-conducting pipeline (4) in the element for passing the refrigerant-conducting pipeline (4) through both the upper and lower compartments (5,6) of the plastic shell (1).

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**4,422,306**

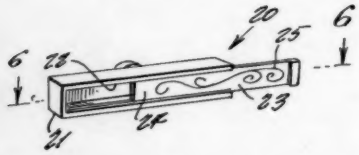
## GARMENT ATTACHMENT INCLUDING OPENABLE ENCLOSURE

**Ted Larson, P.O. Box 22, San Martin, Calif. 95046**

**Filed Oct. 31, 1978, Ser. No. 956,340**

**Int. Cl.³ A44C *25/00***

**U.S. Cl. 63—1 R** **3 Claims**



1. An attachment for garments comprising a hollow enclosure member adapted for use as a storage means having a front side and another side, an opening at said front side, means movably attached to said enclosure member to close and open said front side, said movable means including a movable member having a decorative side facing away from said opening and an apertured portion located within the opening when said movable means closes said front side; means for remvably securing said attachment to a garment and simultaneously securing said movable means in closed relation including a wall at said other side, an aperture in said wall, means for penetrating said garment, passing through said wall aperture and entering said portion aperture, and means for detachably retaining said penetrating means in said garment and apertures.

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**4,422,307**

## SOCK

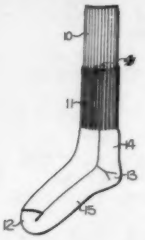
**James L. Thorneburg, P.O. Box 5440, Statesville, N.C. 28677**

**Filed May 24, 1982, Ser. No. 381,531**

**Int. Cl.³ D04B *9/46***

**U.S. Cl. 66—172 E** **9 Claims**

1. A sock including integrally knit upper and lower leg portions, each of said leg portions being knit throughout of body yarn with elastic yarn incorporated in continuously repeated predetermined courses throughout said upper and lower leg portions, said body yarn in said lower leg portion being nonstretchable, having moisture wicking characteristics and being knit in every course of said lower leg portion, said body yarn in said upper leg portion being stretchable and being knit in every course of said upper leg portion, said elastic yarn cooperating with said stretchable body yarn in said upper leg



portion to provide resiliency for supporting the leg of the sock on the leg of the wearer, and said elastic yarn cooperating with said moisture wicking body yarn in said lower leg portion to maintain said lower leg portion in close contact with the leg to aid in the removal of moisture from the leg of the wearer.

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**4,422,308**

## APPARATUS FOR SPREADING A MOVING WEB OF TEXTILE MATERIAL

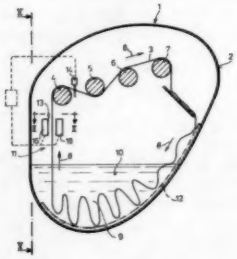
**Manfred Pfeiffer, Michelstadt-Steinbach, and Manfred Schuierer, Michelstadt, both of Fed. Rep. of Germany, assignors to Bruckner Apparatebau GmbH, Erbach, Fed. Rep. of Germany**

**Filed Jun. 12, 1981, Ser. No. 273,230**

**Claims priority, application Fed. Rep. of Germany, Jul. 3, 1980, 3025154**

**Int. Cl.³ D06B *23/00*; B65H *25/26***

**U.S. Cl. 68—13 R** **15 Claims**



1. In apparatus for treating a flat web of textile material having opposite edges, means for moving said web from a treatment and storage zone upwardly through a spreading station, and means downstream from said station for turning said web transversely to follow a path back to said zone, the improvement comprising sensing means for sensing movement of either one of said edges of said web from a preselected position toward the other of said edges; means mounting said sensing means downstream from said turning means; web shifting means mounted at said spreading station, said shifting means comprising a first nozzle unit overlying a part of said web and a second nozzle unit independent of said first nozzle unit and overlying the remainder of said web, one of said nozzle units having fluid passages for directing a stream of fluid obliquely onto said web in a direction toward one edge thereof and the other of said nozzle units having fluid passages for directing a stream of fluid obliquely onto said web in a direction toward the other edge thereof; means for delivering fluid to a selected one or both of said nozzle units for discharge

through the respective fluid passages; and control means responsive to the sensing of movement of either one or both of said edges from said position toward the other to operate said delivering means to deliver fluid to the nozzle unit associated with said one or both of said edges, whereby said one or both of said edges may be returned to its or their preselected position or positions.

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**4,422,309**

## TUNNEL-TYPE BATCH WASHING MACHINE

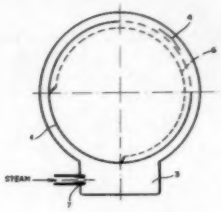
**Herbert Schmidt, Arsolsen, and Hans Steinort, Hildesheim-Itzum, both of Fed. Rep. of Germany, assignors to Senkingwerk GmbH, Hildesheim, Fed. Rep. of Germany**

**Division of Ser. No. 168,458, Jul. 10, 1980. This application May 28, 1982, Ser. No. 383,173**

**Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2927874**

**Int. Cl.³ D06F *21/04, 37/08***

**U.S. Cl. 68—16** **3 Claims**




1. A tunnel-type batch washing machine comprising:
a tunnel-forming housing tube centered on a horizontal axis;
a screw rotatable in said tube about said axis and having a plurality of flights defining a plurality of axially succeeding compartments adapted to receive respective batches of articles to be washed;
a sleeve surrounding and fixed to said screw between same and said tube and formed at one of said compartments with at least one throughgoing aperture;
means for introducing water to the interior of said sleeve at one axial end thereof;
a pocket formed on and opening upwardly into said tube at said one compartment;
means for heating liquid in said pocket; and
means for rotating said screw and sleeve in said tube about said axis and thereby aligning said aperture with said pocket for liquid exchange between said pocket and the interior of said sleeve at said one compartment, said sleeve is formed with a plurality of such apertures in a perforated zone having an angular dimension of less than 180°, said sleeve being provided internally with a perforated member covering said zone and extending axially substantially therebeyond.

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**4,422,310**

## TENSIONING DEVICE

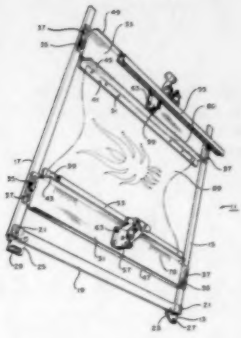
**Larry Eggenberger, 616 NW. Lorna St., Burleson, Tex. 76028**

**Filed Sep. 1, 1981, Ser. No. 298,280**

**Int. Cl.³ C14B *1/26***

**U.S. Cl. 69—19.3** **3 Claims**

1. Method of clamping and tensioning a boot quarter prior to stitching, comprising the steps of:
providing a pallet with a pair of adjustable base strips mounted on said pallet in spaced-apart relationship, each of said strips having an inner edge adapted to receive an opposing edge of the boot quarter to be stitched;
mounting a pivoting bar on each of said base strips by a toggle mechanism, said bars being pivotable between an open position for receiving the opposing edges of the boot quarter to be stitched and a closed position longitudinally aligned with the inner edges of said base strips for clamping and tensioning said boot quarter;
providing said pivoting bars with a plurality of pins on the underside thereof adapted to pierce said boot quarter edges and providing said base strip inner edges with corresponding holes selectively positioned for receiving said pins when said bars are closed;



placing one edge of the boot quarter to be stitched along said inner edge of one of said base strips and clamping said boot quarter edge onto said inner edge with one of said pivoting bars; and
placing the opposing edge of the boot quarter to be stitched along the inner edge of the other of said base strips and tensioning the boot quarter by moving the other of said pivoting bars to the closed position.

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**4,422,311**

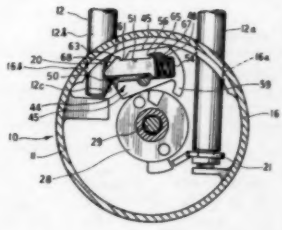
## PADLOCK

**Herbert E. Zabel, Wheaton, and William Lelyk, Roselle, both of Ill., assignors to American Home Products Corporation, New York, N.Y.**

**Filed Apr. 8, 1982, Ser. No. 366,545**

**Int. Cl.³ E05B *37/10, 67/22***

**U.S. Cl. 70—25** **3 Claims**



1. A padlock comprising a body member having shackle leg receiving openings therein, a shackle having legs slidable in said openings, one of said shackle legs having a notch therein, a shackle bolt having an end portion adapted to cooperate with said shackle leg notch so as to effect the locking and unlocking of the shackle, a bolt housing positioned within said body member and provided with a recess to slidably accommodate the shackle bolt therein, spring means arranged within said recess to urge the shackle bolt outwardly whereby to dispose said shackle bolt end portion into locking engagement with said shackle leg notch, said shackle bolt having two upstanding spaced apart shoulder portions, one shoulder portion being disposed outside the housing and positioned to engage the

housing so as to prohibit sliding movement of the shackle bolt into the housing, the other shoulder portion being disposed within the bolt housing recess, means formed in said recess cooperating with said other shoulder portion to maintain said one shoulder portion in its position to engage the housing, and means for moving said shackle bolt out of locking engagement with said shackle leg notch and returning the shackle bolt to locking engagement disposition after the shackle leg notch is removed from said locking engagement disposition.

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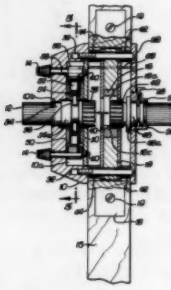
**4,422,312**
**LOCK ASSEMBLY**
**Israel Chermoni, 20 Shoham, Haifa, Israel**
**Filed Dec. 8, 1980, Ser. No. 213,898**
**Int. Cl.³ E05B** *15/10, 15/14, 37/12, 65/06*
**U.S. Cl. 70—133** **6 Claims**



1. A lock assembly comprising:
an exterior cover member including an actuation knob shaft opening and a plurality of combination knob shaft openings;
an exterior knob assembly including an exterior knob located to the outside of the cover member, a shaft passing through the actuation knob shaft opening and attached to the exterior knob and a first toothed gear connected to the end of the shaft opposite the exterior knob, said shaft including a groove substantially perpendicular to the axis thereof located to the inside of the cover member, wherein said knob assembly is axially movable within said opening;
a latchbolt housing;
a latchbolt movable within said housing, said latchbolt including a toothed gear surface, wherein said knob assembly is axially movable to enable the toothed gear to be moved into and out of engagement with the gear surface of the latchbolt;
an interior cover member including a hub having an opening therein;
an interior knob assembly including an interior knob, a shaft passing through the hub of the interior cover member and coupled to the interior knob and a second toothed gear attached to the end of the shaft opposite the interior knob, wherein said second toothed gear engages the gear surface of the latchbolt;
locking means for preventing the exterior knob assembly from being axially moved into engagement with the latchbolt, said locking means including a lock pin housing located adjacent the groove of said first shaft, a plurality of lock pins carried within the lock pin housing and movable into and out of engagement with said groove, spring means for biasing each lock pin away from said groove, and a control assembly for each lock pin, each control assembly including a control knob located to the outside of the exterior cover member, a shaft which passes through one of said combination knob shaft openings and is coupled to the control knob and a cylinder eccentrically connected to the shaft, wherein said cylinder is in contact with its associated locking pin and rotation of the cylinder will cause the locking pin to move into and out of engagement with said groove;
wherein said exterior knob assembly can be engaged with the latchbolt only when there is no locking pin located within said groove;
said lock assembly further including friction means, located adjacent each offset cylinder, for applying a frictional force to each cylinder which increases the force required to rotate the cylinder, said friction means aiding in the prevention of detection of the combination of said lock assembly, wherein said friction means includes a rear cover plate coupled to the rear of said front cover plate and carrying a plurality of adjustable set screws, one located adjacent the rear surface of each offset cylinder, each of said set screws being movable into contact with its corresponding offset cylinder so as to provide said frictional force.

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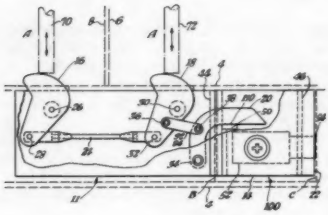
**4,422,313**
**CONTAINER INSIDE LOCKING SYSTEM**
**James VanderWyde, 1730 NW 87 Ave., Plantation, Fla. 33322**
**Filed Oct. 5, 1981, Ser. No. 308,812**
**Int. Cl.³ B65D** *55/14;* **E05B** *65/08;* **E05C** *3/06, 9/16*
**U.S. Cl. 70—167** **4 Claims**



1. A concealed theft-resistant locking system for use in locking the access door system of commercial transportable shipping containers, said locking system operably positioned within the horizontal transverse frame member beneath the access door system, said locking system comprising:
a cam lock assembly having a housing, a cam actuator lever, at least one cam lock, and interconnecting linkage between said lever and said cam lock;
said lever and said cam lock mounted for rotation within said housing;
said linkage operably connected between and translating the pivoting movement of said lever into rotation of said cam lock;
said cam lock rotation effectuating locking engagement or releasing disengagement of said cam lock into a locking cavity in the lower edge of the access door system; and
a removable lock assembly having a lock plate with a generally central key hole, a dead-bolt lock connected to the inner surface of said lock plate, a cover plate integral to and covering the outer surface of and partially extending beyond each vertical edge of said lock plate and having a generally central key hole, and a positioning plate integral and perpendicular to the inner surface of said lock plate;

said cover plate engaging adjacent the outer surface of the adjacent said housing to securely position one side of said lock assembly;

said dead-bolt lock releasably engaging said housing to securely position the other side of said lock assembly;

said cover plate preventing insertion of tools to disengage said locking system when said lock assembly is in place;

said key holes in said lock plate and said cover plate positioned so that a key will pass through said key holes into said lock;

said lock assembly enclosing said lever to prevent access to said lever;

said positioning plate contacting and securing said lever in either a lever-open position or a lever-locked position in relation to said cam lock.

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**4,422,314**

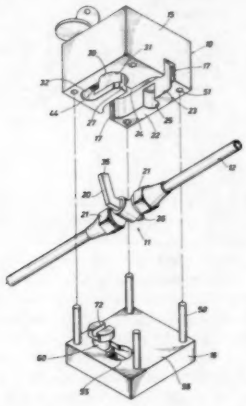
## LOCK FOR A FUEL LINE VALVE

**Wilbur H. Cooper, 2558 Munger, Houston, Tex. 77023**

**Filed Mar. 13, 1981, Ser. No. 243,595**

**Int. Cl.³ B60R *25/04*; E05B *15/16, 65/12*; F16K *35/10***

**U.S. Cl. 70—242** **3 Claims**



1. An anti-theft device for protecting vehicles against theft by locking a fuel line valve in a closed position comprising:

a solid body member constructed of aluminum and having a recess for receiving a fuel line valve and valve handle in a closed position for preventing flow through the valve, said recess having openings for receiving piping attached to the valve;

a lid member constructed of aluminum and adapted to cover said recess and said openings for enclosing a fuel line valve in a closed position within said body member;

pin means extending transverse to said lid member and disposed within said lid member and said body member when said lid member covers said recess, said pin means being constructed of hardened steel;

locking means for interconnecting and releasing said lid member relative to said body member including lug means in one of said lid member and said body member said lug means being rotatable between an interconnecting position locking said lid member to said body member and a released position unlocking said lid member relative to said body member and including key operating means in the other of said lid member and said body member for rotating and lug means, said key operating means and said lug means having means for connecting said key operating means and said lug means to one another when said lid member covers said recess.

**4,422,315**

## KEY HOLDER

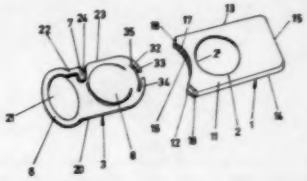
**Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Prisenta KG Weber & Co., Solingen, Fed. Rep. of Germany**

**Filed Jul. 7, 1981, Ser. No. 280,970**

**Claims priority, application Fed. Rep. of Germany, Jul. 24, 1980, 3027979**

**Int. Cl.³ A44B *15/00*; A45C *11/32***

**U.S. Cl. 70—456 R** **14 Claims**



1. In a key holder having at least one elastic ring which can be inserted through a hole in a key head, which ring is continued by sections which can be inserted into a flat sleeve and held therein in a detent position, the improvement wherein

said sleeve has a wall forming at least one shaft and an opening formed in said wall,

at least one plate having the ring extending from one side edge of said plate in one piece therewith and in the same plane therewith, said plate being insertable into said shaft of said flat sleeve,

said plate is made of elastic material and is formed with a notch on another side edge thereof, said notch in an inserted position of said plate in said sleeve is disposed within said shaft of said flat sleeve,

said ring has an end extending freely with inherent elastic biasing into said notch such that said end is bendable out of said notch and automatically returnable therein upon release by the elastic biasing,

said plate forms a detent pawl formed as a push button,

said detent pawl snaps into said opening in said wall of said flat sleeve in said inserted position,

said sleeve constitutes means for securing said end of said ring in three dimensions in cooperation with said notch when said plate is in said inserted position in said sleeve, whereby said end of said ring is held substantially immovable in three-dimensions in said inserted position of said plate in said shaft of said sleeve, via said sleeve and said notch, and respectively when said end of said ring is moved out of said shaft after release of said detent pawl from said opening said end of said ring is automatically free to be bent open out of said notch for the insertion and removal of keys.

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**4,422,316**

## KEY CASE

**Richard D. Thomas, 5816 W. 55th St., Chicago, Ill. 60638, and William R. Kjeldsen, 10352 S. Homan Ave., Oak Lawn, Ill. 60655**

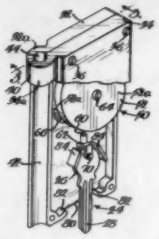
**Filed Jul. 16, 1981, Ser. No. 283,995**

**Int. Cl.³ A47G *29/10***

**U.S. Cl. 70—456 R** **5 Claims**

1. In combination with a door attached to a door frame by hinge means having a removable pin and including a lock on said door having a lock cylinder for receiving a key for operating said lock cylinder, a key case having a sleeve adapted to be aligned with the hinge means of the door and to receive said removable pin for securement to said hinge means, a retracting mechanism in said key case including a flexible member having a length at least as great as the spacing between said hinge means and said lock cylinder attached at the free end of the flexible member, an opening in the key case for admitting the key, and stop means within the key case defining a stored

position for said key whereby a portion of the key extends outwardly through the opening in the key case, said portion of the key being adapted to be gripped in an emergency situation



and moved to said lock cylinder to operate it and said retracting mechanism being adapted to return said key to its stored position when released or dropped.

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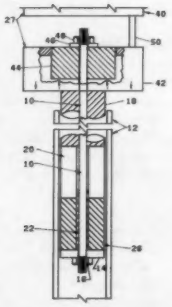
**4,422,317**

## APPARATUS AND PROCESS FOR SELECTIVELY EXPANDING A TUBE

**Richard A. Mueller, Tulsa, Okla., assignor to Cities Service Company, Tulsa, Okla.**

**Filed Jan. 25, 1982, Ser. No. 342,338**
**Int. Cl.³ B21D *39/08***
**U.S. Cl. 72—58** **10 Claims**



1. An apparatus for radially expanding the wall of a tube at selective locations about the circumference of the tube comprising:

(a) a shaft extending axially inside the tube;

(b) an inner cap bound to the shaft for longitudinal axial movement in combination with the shaft with respect to the tube;

(c) an outer cap slidably mounted on and along the shaft for longitudinal axial movement on and along the shaft with respect to the tube, said outer cap including at least one prong means bound thereto;

(d) a bushing means slidably mounted on and along the shaft between the outer cap and the inner cap for longitudinal axial movement on and along the shaft with respect to the tube, said bushing means including a structure defining at least one longitudinal slot longitudinally traversing said bushing means, said longitudinal slot registering said prong means therein;

(e) an elastomeric means slidably lodged within the longitudinal slot of said bushing means; and

(f) a means for pulling the shaft in one axial direction while simultaneously pushing the outer cap in the opposite axial direction, such that when the inner cap contacts the bushing means and the prong means contacts the elastomeric means the continuing respective axial forces from pulling and pushing, in combination with the prong means of the outer cap in contact with the elastomeric means within the longitudinal slot, compress and thereby radially expand the the elastomeric means at predetermined selective locations against the wall of said tube resulting in selective radial expansion of the tube wall.

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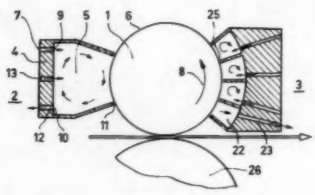
**4,422,318**

## ROLLER WITH A ROLLER SURFACE WHICH IS TO BE HEATED OR COOLED

**Alfred Christ, Zurich; Rolf Lehmann, Rudolfstetten, and Beat Schlatter, Mutschellen, all of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland**

**Filed Jan. 19, 1981, Ser. No. 226,540**
**Claims priority, application Switzerland, Jan. 25, 1980, 603/80**
**Int. Cl.³ B21B *27/06***
**U.S. Cl. 72—200** **19 Claims**



1. A roller having a surface which is to be heated or cooled by means of a fluid and equipped with heat exchange apparatus comprising at least one chamber for said fluid which is adjacent and opens toward said surface and has a substantially square internal cross section in a plane transverse to the roller axis; chamber walls which coact with said roller surface to form a fluid gap; means clamping the chamber in the circumferential direction of the roller; an inlet duct having a mouth through which said fluid is introduced into the chamber and which duct is sized to cause the inflowing fluid to experience a pressure drop of less than 5 bar; and a fluid outlet duct located behind the mouth of the inlet duct in the direction of movement of the roller surface and through which fluid leaves the chamber, the combination of said chamber cross section and relative duct orientation serving to create turbulence in the fluid within the chamber and the heat exchange apparatus serving to limit the pressure in the chamber to less than 5 bar.

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**4,422,319**

## APPARATUS FOR TESTING GRAINS FOR RESISTANCE TO DAMAGE

**Marshall F. Finner, Middleton, and Shiw S. Singh, Madison, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.**

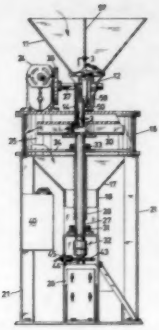
**Filed Sep. 21, 1981, Ser. No. 303,966**
**Int. Cl.³ G01N *3/30***
**U.S. Cl. 73—12** **14 Claims**

1. Apparatus for testing agricultural grains for resistance to damage, comprising:

(a) a housing having a smooth, cylindrical inner impact wall;

(b) an impeller mounted for rotation within the housing having a cylindrical disk body with two opposite faces and a cylindrical peripheral rim, radial channels formed in one of the faces extending most of the distance of the radius of the disk body and intersecting at the center of the disk body and adapted to receive grains for testing at such

center, the channels being narrow relative to the diameter of the disk body, and;



(c) means for rotating the impeller at a substantially constant rotational speed.

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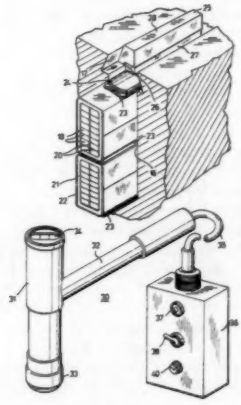
4,422,320

## WEDGE TIGHTNESS MEASURING DEVICE

Donald G. Moorby; Graham T. McMillen, and Ralph S. Flemons, all of Peterborough, Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Feb. 1, 1982, Ser. No. 344,795
Claims priority, application Canada, Feb. 20, 1981, 371363
Int. Cl.³ G01N 3/30; G01M 7/00
U.S. Cl. 73—12 8 Claims



1. A device for determining the tightness of an object where tightness is related to the spring-like quality of the object, comprising:

a tapping unit for tapping the object whose tightness is to be determined;

an accelerometer mounted to said tapping unit for providing a pulse signal having a time duration representing the time interval said tapping unit is in contact with said object;

means connected to said accelerometer for receiving said pulse and providing an output representing said time duration only when the time integral of said pulse is between a predetermined upper and a lower limit; and,

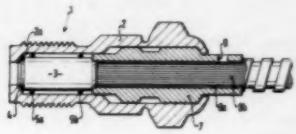
display means for receiving said output and responsive thereto for displaying a value proportional to said time duration and representing tightness.

4,422,321

## COMBUSTION PROCESS SENSOR CONSTRUCTION

Klaus Müller, Tamm, and Franz Rieger, Aalen-Wasseralfingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 26, 1981, Ser. No. 314,651
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1980, 3042399
Int. Cl.³ G01L 23/22
U.S. Cl. 73—35 18 Claims



1. Combustion process sensor structure to determine physical processes occurring in the combustion space of a combustion chamber in an internal combustion engine, having

a tubular housing (2) having a central opening;

a light guide cable (8*b*) extending into the opening of the housing;

a quartz-glass rod (3) located in the opening of the housing, said housing comprising an inwardly extending shoulder (2*a*) formed on one end portion of the housing to receive and support a first end portion of the quartz-glass rod facing the combustion chamber;

a sealing ring interposed between the first end portion of the quartz-glass rod and said inwardly extending shoulder;

and an abutment sleeve (7) bearing against the other end portion of the quartz-glass rod, received and secured in fixed axial position within the housing to thereby retain the quartz-glass rod in position in the housing and in sealing engagement with said sealing ring (4),

the light guide cable (8*b*) extending through the abutment sleeve (7) and being retained therein and positioned in light-transmitting relationship with respect to the other end portion of the quartz-glass rod (3).

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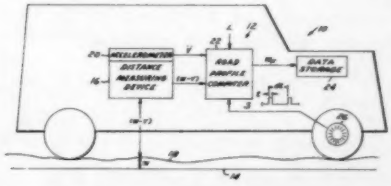
4,422,322

## METHOD AND SYSTEM FOR MEASUREMENT OF ROAD PROFILE

Elson B. Spangler, Bloomfield Hills, Mich. 48013

Filed Apr. 27, 1982, Ser. No. 372,322
Int. Cl.³ G01B 5/28
U.S. Cl. 73—105 8 Claims




1. In a method of measuring road surface profile which includes the steps of providing a vehicle having a suspended mass adapted to be propelled over a road surface, measuring distance from the suspended mass to the road surface as the vehicle is propelled over the road surface, determining acceleration of said suspended mass with respect to the road surface as the vehicle is propelled over the road surface, and determining road surface profile as a combined function of said distance and acceleration,

the improvement for measuring said road surface profile independently of variations in vehicle speed over said

road surface comprising the steps of determining spatial domain acceleration of said suspended mass as a conjoint function of acceleration of said suspended mass with respect to said road surface and distance traveled over said road surface, and then determining said road surface profile in the spatial domain as a conjoint function of said spatial domain acceleration, said distance to the road surface.

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**4,422,323**

## COMBUSTION PROCESS OBSERVATION ELEMENT CONSTRUCTION

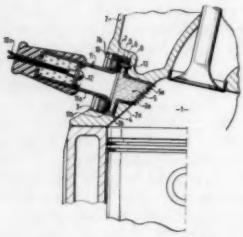
**Ernst Linder, Mühlacker; Helmut Maurer, Vaihingen, and Klaus Muller, Tamm, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Jan. 22, 1982, Ser. No. 341,841**

**Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 3106330**

**Int. Cl.³ G01M *15/00***

**U.S. Cl. 73—116** **9 Claims**



1. The combination of a combustion chamber formed in a structural block (2, 22) particularly for observation of combustion within the cylinder block of an internal combustion engine to monitor combustion occurring therein,

a combustion process observation element for observation of combustion within the combustion chamber,

wherein

the block is formed with an opening (3, 3') through which the observation element is introducible, and for retention therein, the opening including

a stepped bore, having an inner portion (3*a*) adjacent the combustion chamber (1) of a predetermined diameter, and an outer portion (3*b*) remote from the combustion chamber, and which has a diameter larger than said predetermined diameter of the inner portion,

and a seating surface (4) separating said inner and outer portions;

and wherein the observation element includes

a separable assembly comprising

a tubular housing (11) and light-sensitive pick-up means (12) located in the housing;

a window (5) closing off the opening and separating the interior of the combustion chamber (1) from the light-sensitive means (12),

the window having an inner portion (5*a*) having a cross section to fit into the inner portion (3*a*) of the opening, and an outer flange (6) having a cross section larger than said cross section of the inner portion and fitting against said seating surface (4) of the opening (3, 3') in the block;

the tubular housing (11) being formed with a flange (11*b*) fitting against the flange (6) on the window;

and releasable positioning means (7, 14) securing and clamping the window and the housing in position with one surface of the flange (6) on the window fitting against the seating surface (4) of the opening (3), and one surface of the flange (11*b*) of the tubular housing (11) seated against an opposite surface of the flange (6) of the window (5), the releasable positioning means (7, 14) bearing against the opposite surface of the flange (11*b*) of the tubular housing,

the tubular housing providing an unobstructed light path between the window and the light-sensitive pick-up means (12) and being separable from the window to permit separate, individual removal and replacement of the window, and of the housing with the light-sensitive pick-up means therein, respectively.

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**4,422,324**

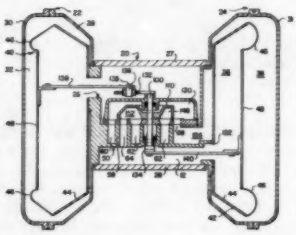
## FOUR CHAMBER DIRECT DRIVE GAS METER

**John L. Esola, Falls Creek, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.**

**Filed Nov. 20, 1981, Ser. No. 323,330**

**Int. Cl.³ G01F *3/20***

**U.S. Cl. 73—266** **12 Claims**



1. A gas meter comprised of two spaced diaphragm compartments each containing a diaphragm which divides its respective compartment into inner and outer discrete measuring chambers, a control chamber pressure sealed with respect to said measuring chambers and the exterior of the meter, discrete passage means extending between each of said measuring chambers and said control chamber, inlet passage means extending between said control chamber and the inlet to said meter, outlet passage means extending between said control chamber and the outlet of said meter, valve means within said control chamber, rotatable shaft means having a first portion enclosed within said control chamber and which is drive connected with said valve means and a second portion which extends exteriorly of said control chamber, crank means drive connected with said second portion of said shaft means, and means connecting said diaphragms to said crank means whereby upon concomitant reciprocating movement of said diaphragms said valve means will be driven to connect each of said discrete passages sequentially with said inlet passage means and said outlet passage means, the second portion of said shaft being comprised of two extensions of said shaft each extending from an opposite side of said control chamber, and said crank means is comprised of a crank arm secured to each of said extensions, each of said diaphragms being respectively connected to one of said crank arms.

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**4,422,325**

## DUAL PURPOSE WATER METER COVER

**Ray Sutherland, Hopewood, and Mark S. Wood, Lemont Furnace, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.**

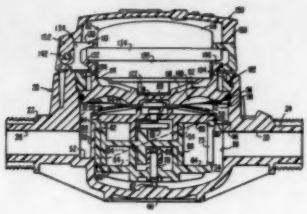
**Filed Feb. 24, 1982, Ser. No. 351,828**

**Int. Cl.³ G01F *15/14***

**U.S. Cl. 73—273** **9 Claims**

1. A water meter comprised of a generally hollow main case having an opening, a closure member for closing said opening, securing means associated with said closure member and en-

gaging said main case for releasably retaining said closure member in said opening, a register cover removably mounted



on said meter, means on said cover for disengaging said securing means from said main case.

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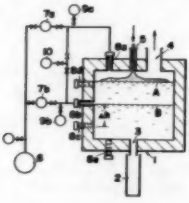
4,422,326

## METHOD OF ASCERTAINING THE STATE INSIDE MELTING FURNACE FOR RADIOACTIVE WASTE

Noriaki Sasaki, Tokai, Japan, assignor to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed May 19, 1981, Ser. No. 266,063
Claims priority, application Japan, Aug. 26, 1980, 55-117342
Int. Cl.³ G01F *23/14*
U.S. Cl. 173—291 4 Claims



1. A method of ascertaining the state inside a melting furnace for a radioactive waste, which method comprises the steps of:

(1) blowing a gas into a molten matter in the melting furnace by using a least two slender tubes including a first tube opening into the furnace at an upper point thereof and a second opening into the furnace at a lower point thereof with a gap Δh between the upper and lower points;

(2) detecting a back pressure difference ΔP at the openings of the first and second tubes to determine the density ρ of the molten matter in accordance with the following equation:

$$\rho = \Delta P / g \Delta h$$

where g is the gravitational acceleration;

(3) detecting a minimum pressure P required for releasing gas bubbles into the molten matter from one of the at least two slender tubes;

(4) determining the level h of the molten matter in the furnace using the density determined in step (2) and in accordance with the following equation:

$$h = \frac{P - P_O - 2\gamma/r}{\rho g},$$

where

$P_O$ is the pressure on the surface of the molten matter,

$\gamma$ is the surface tension of the molten matter, and

r is the radius of the one of the at least two slender tubes;

(5) determining the relationship between a quantity of the waste charged into the melting furnace and the pressure P in a normal case where the charges waste is molten in the furnace; and

(6) monitoring the pressure P to detect a shift of the pressure P from the relationship obtained in step (5) to thereby detect the formation of a bridge inside the furnace comprising non-molten solid matter of the charged waste.

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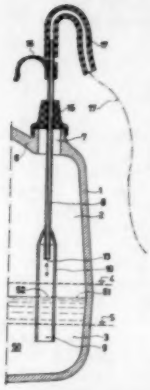
4,422,327

## LIQUID LEVEL INDICATOR APPARATUS

Stig Anderson, V. Frölunda, Sweden, assignor to Ingenjörsfirman Installationsjänst AB, Hisings Backa, Sweden

Filed Mar. 18, 1981, Ser. No. 244,894
Int. Cl.³ G01F *23/00*; B65G *11/20*
U.S. Cl. 73—303 1 Claim



1. In a vehicle: an apparatus for indicating the level of at least two bodies of different liquids in said vehicle,

a relatively flat housing mounted in said vehicle, and having a front and a rear,

a chamber in said housing and having a display tube containing an indicator liquid and being arranged at the front of said housing,

selecting means arranged at the rear of said housing, an air passage connected between said chamber and said selecting means,

at least two air conduits connected between said selecting means and said at least two bodies of liquid,

at least two dip tubes immersed respectively in said bodies of liquid and connected each to one of said air conduits,

air displacing means arranged within said housing and operatively connected to said air passage,

whereby upon operation of said air displacing means the volume portion of a selected one of said bodies of liquid present inside the selected dip tube is expelled therefrom by air pressurized inside the selected one of said air conduits, whereupon the pressure of said selected body of liquid is brought into communication with said chamber containing said indicator liquid so as to raise the level of said indicator liquid inside said display tube to a level corresponding to the level of said selected body of liquid,

said selecting means comprising a switching member for individually connecting a selected one of said air conduits with said air passage, said switching member consisting of an arm pivotally supported at one of its ends, the other end carrying a grip protruding laterally from said housing, also comprising a series of notches adapted to receive said arm, each of said notches defining a switching position of said switching member, and a series of projections respectively separating said series of notches, and also comprising a spring arrangement biasing said switching member

against a selected one of said notches for a positive guidance thereof,

whereby upon said switching member approaching any one of said switching positions it is guided for a movement axially of said air passage,

and whereby in the switching position of said switching member a sealed connection between said switching member and said air passage is established through the action of said spring bias and one of said notches.

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**4,422,328**

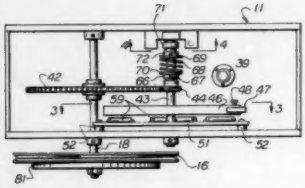
**LIQUID LEVEL SENSOR**

**Charles E. Luchessa, San Rafael, and Timothy E. Brown, Danville, both of Calif., assignors to Sierra Misco, Berkeley, Calif.**

**Filed Oct. 13, 1981, Ser. No. 310,792**

**Int. Cl.³ G01F *23/12***

**U.S. Cl. 73—313** **7 Claims**



1. A liquid level sensor comprising a shaft, means for turning said shaft dependent upon the upper surface level of the liquid to be sensed, an arm pivotable about an axis as said shaft turns, a magnet on said arm, a board parallel to the plane of movement of said magnet, a plurality of reed switches on said board disposed radially with respect to said axis and angularly spaced apart so that as said magnet turns said switches are closed one-by-one, and an electric circuit including an electronic digital accumulator and said switches, said accumulator counting the number of times said switches are closed and adding or subtracting from the previous number depending on the direction of rotation of said arm, a countershaft parallel to said first-mentioned shaft and means for turning said countershaft proportional to turning of said first-mentioned shaft, said arm being fixed to said countershaft, first, second and third concentric arcuate conductors on said board, connected into said electric circuit, a first series of switches being connected to the first and second conductors, a second series of said switches being connected to the first and third conductors, switches of said first and second series alternating around said board.

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**4,422,329**

**APPARATUS AND METHOD FOR MEASURING CHANGES IN AMBIENT GRAVITY FIELDS**

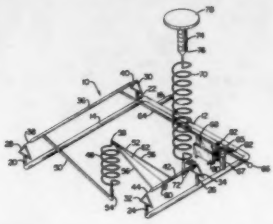
**Christopher Richards, Arvada, and Karl Pelegrin, Evergreen, both of Colo., assignors to Delta-G Instruments, Inc., Evergreen, Colo.**

**Filed Feb. 17, 1981, Ser. No. 234,893**

**Int. Cl.³ G01V *7/08***

**U.S. Cl. 73—382 R** **21 Claims**

1. In a gravity meter mounted to a rigid framework and having a reaction mass mounted on a weight beam coupled to a suspension system whereby said beam is movable in response to changes in the ambient gravitational field, the improvement comprising a nulling and position sensor assembly including a dielectric mass and a pair of spaced-apart conductors, one of said dielectric mass and said pair of conductors being rigidly secured to said weight beam for movement in a first plane parallel to the plane of movement of said weight beam and the other of said dielectric mass and said pair of conductors being rigidly and immovably secured to said framework, said conductors having a cavity therebetween and oriented in places parallel to and on either side of said first plane and a portion of said dielectric mass extending into said cavity, movement of said beam causing corresponding transverse movement of said dielectric in said first plane and into and out of said cavity,



means connected to said condutors conductors for varying the electric potential therebetween, and means connected to said conductors for measuring the capacitance thereof.

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**4,422,330**

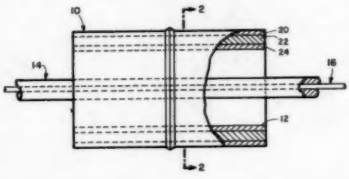
**LOW SUSCEPTIBILITY PROOF MASS FOR A SINGLE AXIS DRAG COMPENSATION SYSTEM**

**Robert E. Fischell, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed May 7, 1981, Ser. No. 261,353**

**Int. Cl.³ G01P *15/08***

**U.S. Cl. 73—517 R** **8 Claims**



1. A satellite single axis drag compensation system of the type including a cylindrical proof mass of predetermined length and a longer conductive rod extending coaxially through a central bore of said proof mass and adapted to carry a current for inducing eddy currents in said proof mass for suspension thereof by repulsion forces, said system being characterized by the improvement comprising:

an elongate, permanent magnet element, carried by said conductive rod, said element being coaxial with said rod and having a length greater than said predetermined length and being magnetized perpendicularly to its axis and uniformly along its length whereby movements of said proof mass are damped; and

said proof mass comprising a plurality of concentric cylindrical layers of conductive material, said layers of conductive material being alternately of diamagnetic and of paramagnetic susceptibility, whereby total susceptibility of said proof mass is below a level that will interact with said permanent magnet element with sufficient force to overcome said repulsion forces.

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**4,422,331**

**PHASE MODULATOR LASER ACCELEROMETER**

**Clifford G. Walker, 915 Weatherly Rd., Huntsville, Ala. 35803**

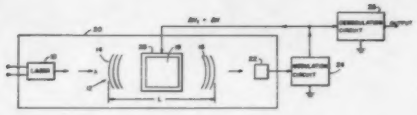
**Filed Apr. 2, 1982, Ser. No. 364,745**

**Int. Cl.³ G01P *15/13***

**U.S. Cl. 73—517 B** **10 Claims**

1. A phase modulation laser accelerometer comprising: a laser for generating a beam of coherent light, photodetection

means, a resonant cavity, made of a material having refractive index that changes in response to pressure, disposed between said laser and said photodetection means for providing an optical path therebetween, a proof mass disposed adjacent to said resonant cavity for subjecting said cavity to pressure in response to acceleration substantially normal to the direction



of said laser beam, phase modulation means disposed for shifting the phase of laser light passing through said cavity, and feedback means responsive to said photodetection means for providing a variable voltage feedback to said phase modulation means in response to acceleration forces, said variable voltage feedback being indicative of said acceleration forces.

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**4,422,332**

## DYNAMIC FOCUSING AND SECTORIAL SCANNING ECHOGRAPHY DEVICE

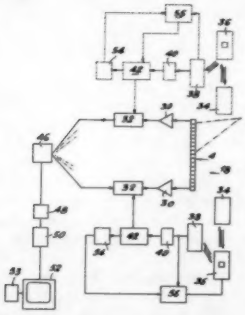
**Jean-Charles Dubuis, Saint Martin d'Heres; Michel Martin, Eybens; Bernard Piaget, Gieres; Jean-Francois Piquard, Vizille, and Jacques Vacher, Seyssinet, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France**

**Filed May 18, 1981, Ser. No. 264,576**

**Claims priority, application France, May 19, 1980, 80 11109**

**Int. Cl.³ G01N *29/00***

**U.S. Cl. 73—625** **6 Claims**



1. An echography device containing a linear bar of juxtaposed piezoelectric transducers, said bar comprising a transmitting portion, said transmitting portion comprising transmitting transducers adapted to transmit ultrasonic waves, said transmitting transducers being energized by delayed electric signals so that said transmitted ultrasonic waves are oblique with respect to said bar, and a receiving portion, said receiving portion comprising receiving transducers adapted to receive ultrasonic waves reflected from echo-points, each of said receiving transducers being electrically connected to a separate shifting analog register controlled by clock signals delivered by an associated oscillator, each of said shifting registers being adapted to generate a delay equal to the clock period, wherein said oscillators are frequency-controlled and each of said oscillators is associated with a frequency servo-device adapted to render the frequency delivered by said oscillator equal to a reference frequency, and further comprising:

(a) means for digitally storing a value related to said clock signals of each of said oscillators so as to store the plurality of delays provided by said shifting registers in order that the signals detected by said receiving transducers correspond to the ultrasonic waves reflected by a single echo-point, said means permitting the modification of said delays for each echo-point and at any moment, said delays being determined by said reference frequency which is dependent on the transmitting direction of said ultrasonic waves; and

(b) an adder connected to said shifting analog registers, the output signal provided by said adder corresponding to the amplitude of the ultrasonic waves reflecting from said single echo-point.

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**4,422,333**

## METHOD AND APPARATUS FOR DETECTING AND IDENTIFYING EXCESSIVELY VIBRATING BLADES OF A TURBOMACHINE

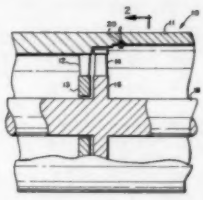
**Robert L. Leon, Roslyn, Pa., assignor to The Franklin Institute, Philadelphia, Pa.**

**PCT No. PCT/US80/01341, § 371 Date Apr. 29, 1982, § 102(e) Date Apr. 29, 1982, PCT Pub. No. WO82/01416, PCT Pub. Date Apr. 29, 1982**

**PCT Filed Oct. 10, 1980, Ser. No. 385,661**

**Int. Cl.³ G01M *15/00***

**U.S. Cl. 73—660** **9 Claims**



1. A method for detecting and identifying an excessively vibrating blade of the rotating portion of a turbomachine by analysis of the characteristic Doppler waveform resulting from the vibrating blade comprising the steps of:

sensing the acoustic energy at a fixed location proximate the rotating portion of the turbomachine to generate a composite electrical signal;

synchronous time averaging the composite signal to remove random noise and non-order related components therefrom;

blanking out the order related noise components of the synchronous time averaged signal to reveal the characteristic Doppler waveform of the vibrating blade; and

displaying the resulting characteristic Doppler waveform to indicate the location of the excessively vibrating blade and its relative vibration amplitude.

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**4,422,334**

## HYDROSTATIC BEARING TYPE COUPLING FOR USE IN VIBRATING MACHINE

**Osamu Yasuda, Yokosuka, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 19, 1981, Ser. No. 312,837**

**Int. Cl.³ B06B *1/10*; G01M *7/00***

**U.S. Cl. 73—665** **5 Claims**

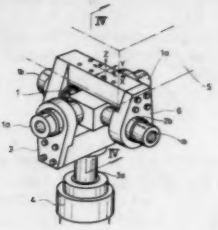
1. A device for coupling a vibrating test table to a vibrator, comprising:

(a) a first pair of spaced axially aligned shafts,

(b) a second pair of spaced axially aligned shafts which are spaced equally to the spacing of the first pair, and the axis of which intersects the axis of the first pair midway between the shafts of the first pair, whereby the shafts are positioned in co-planar relation at 90° intervals about the point of intersection of their axes,

(c) a hydrostatic bearing for each shaft which permits rotational and sliding movement of the shaft in the bearing,

(d) means connecting the hydrostatic bearings for one pair of aligned shafts to a vibrator, and



(e) means connecting the hydrostatic bearings for the other pair of aligned shafts to a vibration table.

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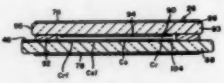
**4,422,335**

## PRESSURE TRANSDUCER

**David H. Ohnesorge, and Frank J. Antonazzi, both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.**

**Filed Mar. 25, 1981, Ser. No. 247,482**
**Int. Cl.³ G01L 9/12**
**U.S. Cl. 73—724** **14 Claims**



1. A capacitive pressure transducer comprising:
a first substrate of insulative material;
a second substrate of insulative material;
at least one of said substrates being flexible and deforming in response to a pressure change;
a first signal plate of electrically conductive material formed on a surface of said first substrate;
a second signal plate of electrically conductive material formed on said first substrate surface;
a third signal plate of electrically conductive material formed on said first substrate surface;
a fourth signal plate of electrically conductive material formed on said first substrate surface;
a fifth common plate of electrically conductive material formed on a surface of said second substrate;
said first and second substrates positioned from each other such that a gap exits between said plates on said first and second surfaces wherein first, second, third, and fourth capacitors are formed between said first, second, third, and fourth plates and said fifth plate, respectively, said fifth plate serving as a common plate for combining excitation signals input to said signal plates into a single signal; and
wherein said signal plates are formed on said first substrate and said common plate is formed on said second substrate such that the capacitance versus pressure characteristics for said first, second, third, and fourth capacitors have a predetermined relationship which does not vary because of the production variables of the transducer.

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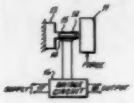
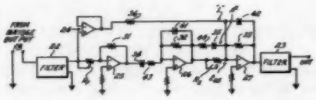
**4,422,336**

## INSTRUMENTATION RESONANCE COMPENSATION

**James C. Beebe, Medina, Ohio, assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio**

**Filed Dec. 2, 1981, Ser. No. 326,558**
**Int. Cl.³ G01B 7/16**
**U.S. Cl. 73—769** **6 Claims**





1. An electronic compensation network, for compensating for mechanical instrumentation resonance in an instrumentation system which is responsive to a mechanical actuation to produce an electrical instrumentation output signal, the instrumentation system having a mechanical response characteristic representative of mechanical resonance which is substantially that of a simple resonant system having an equivalent transfer function in the form of an electrical second order filter comprising an electronic circuit having:
an input coupled to the electrical instrumentation output signal of the instrumentation system,
a plurality of sections which are interconnected to produce the inverse of the transfer function of the instrumentation resonance, the sections being interconnected to combine a first function representative of a constant term, a second function representative of a first derivative term, and a third function representative of a second derivative term, all of which operate upon the signal at the input to the compensation circuit, and
coupled to the combined outputs of the interconnected circuit sections, an output at which is produced a compensation network output signal which is a substantially accurate representation of the mechanical actuation.

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**4,422,337**

## METHOD OF COMPENSATING THE INTERFERENCE DC VOLTAGES IN THE ELECTRODE CIRCUIT IN MAGNETIC-CONDUCTIVE FLOW MEASUREMENT

**Peter Hafner, Therwil, Switzerland, assignor to Flowtec AG, Reinach, Switzerland**

**Continuation-in-part of Ser. No. 254,634, Apr. 16, 1981, Pat. No. 4,382,387. This application Sep. 21, 1981, Ser. No. 304,169**
**Claims priority, application fed. Rep. of Germany, Oct. 2, 1980, 3037283; Aug. 17, 1981, 3132471**
**Int. Cl.³ G01F 1/60**
**U.S. Cl. 73—861.17** **6 Claims**

1. A method of compensating interference voltages occuring in the electrode circuit of an inductive flow measurement circuit where a periodically reversed DC magnetic field is applied to a flowing electrically conductive liquid and at least two electrodes are disposed in the liquid from which an alternating signal voltage is obtained, sampling said signal voltage during first and second sampling intervals respectively occurring during successive, opposite polarities of the signal voltage,

storing each sample value obtained during the first sampling interval in a first integrating storage member, storing each sample value obtained during the second sampling interval in a second integrating storage member and forming the difference of the sample values stored in the integrating storage members, said method comprising the steps of:

sampling the full instantaneous value of the signal voltage during a brief interval occurring at the beginning of each sampling interval and storing the sampled instantaneous value in its associated integrating storage member; and

integrating the signal voltage by means of the associated integrating storage member during the remainder of each sampling interval subsequent to said brief interval.

5. Apparatus for effecting inductive flow measurement of an electrically conductive liquid flowing in a conduit, comprising:

a magnetic field generator for generating a periodically reversed magnetic field passing through the conduit perpendicularly to the flow direction;

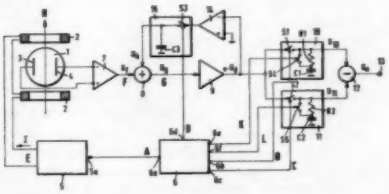
a measuring amplifier;

two electrodes disposed in the conduit for applying to the measuring amplifier an alternating signal voltage;

first and second integrating storage members, each comprising a resistor and a capacitor;

first switching means connected between the output of said measuring amplifier and said first integrating storage member;

second switching means connected between the output of said measuring amplifier and said second integrating storage member;



third switching means connected in parallel to the resistor of said first integrating storage member;

fourth switching means connected in parallel to the resistor of said second integrating storage member;

control means controlling said first and third switching means to connect said first integrating storage member to the output of said measuring amplifier during a first sampling interval occurring during each first polarity of the signal voltage and to short circuit the resistor of said first integrating storage member for a first brief interval occurring at the beginning of each said first sampling interval to thereby charge the capacitor of the first integrating storage member to the full instantaneous value of the signal voltage occurring during the first brief interval, said control means further controlling said second and fourth switching means to connect said second integrating storage member to the output of said measuring amplifier during a second sampling interval occurring during each second polarity of the signal voltage and to short circuit the resistor of said second integrating storage member for a second brief interval occurring at the beginning of each said second sampling interval to thereby charge the capacitor of the second integrating storage member to the full instantaneous value of the signal voltage occurring during the second brief interval; and

circuit means connected to the outputs of said first and second integrating storage members for forming the difference of the stored sample values.

## 4,422,338

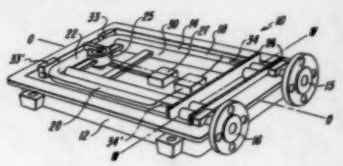
## METHOD AND APPARATUS FOR MASS FLOW MEASUREMENT

James E. Smith, Boulder, Colo., assignor to Micro Motion, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 235,268, Feb. 17, 1981, abandoned. This application Jul. 6, 1981, Ser. No. 280,297

Int. Cl.³ G01F 1/84

U.S. Cl. 73—861.38 27 Claims



1. In a Coriolis force mass flow rate meter including at least one continuous curved conduit solidly mounted at the open ends of leg portions thereof, which conduit is adapted to oscillate about an axis passing substantially through the mounting points of the legs, and further including mass flow rate readout means adapted to indicate mass flow rate as a function of the time delays in each direction of oscillation between the passage of one side leg of the curved conduit through a predetermined point of its oscillation and the passage of the other side leg of said conduit through a corresponding predetermined point of its oscillation, the improvement which comprises:

at least one pair of sensors, one member of each pair being mounted on opposite side legs of the conduit, the sensors being adapted to generate an analog signal linearly representative of the actual oscillatory movement of the sides of the curved conduit at the location of the respective sensor; and

means to electronically detect the time delay between the analog sensor signals corresponding to the time difference in the passage of the opposite sides of the curved conduit through points near the mid-plane of oscillation;

whereby the magnitude of the time delay between the sensor outputs representing the time difference in passage through the mid-plane of oscillation is a measure of the mass flow rate through the curved conduit.

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## 4,422,339

## ORIFICE FITTING FOR A GAS PRESSURE DIFFERENTIAL-MEASURING SYSTEM

Adam F. Gall, and Howard P. McJunkin, Jr., both of Charleston, W. Va., assignors to McJunkin Corporation, Charleston, W. Va.

Filed Oct. 25, 1982, Ser. No. 436,458

Int. Cl.³ F15D 1/02

U.S. Cl. 73—861.61 4 Claims

1. An orifice fitting for a gas pressure differential-measuring system, comprising:

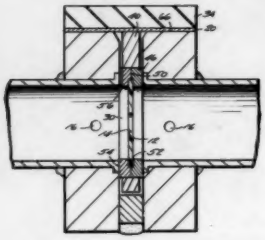
(a) two block members, each having means defining an inner face and means defining a throughbore intersecting and extending through that face;

(b) two lengths of pipe each being flared at an inner end thereof so as to define a respective radially outwardly projecting circumferential flange;

(c) each pipe projecting into a respective said throughbore through the inner face of the respective block member and having an outer end portion of that pipe protruding from the opposite end of the respective throughbore to provide a pipe stub extending from the respective block member;

(d) a circumferential weldment joining each pipe stub to the respective block where that pipe stub emerges from the respective throughbore thus constituting two respective orifice block assemblies;

(e) a U-shaped spacer having two legs and a bridge, said two orifice block assemblies, disposed inner faces inwards, being disposed in sandwiching relation to said U-shaped spacer, and a weldment being provided about the external periphery of said U-shaped spacer, between the U-shaped spacer and both said blocks, thereby constituting a unitary body having a laterally opening slot through one side,



between the legs of the U-shaped spacer and in communication with the inner ends of both of said pipes;

(f) said side of said body being constructed and arranged for mounting and sealing of an orifice holder assembly thereto; and

(g) means defining a pressure tap through each said orifice block assembly spacedly adjacent said slot.

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**4,422,340**

## DIFFERENTIAL PRESSURE FLOWMETER FOR A GAS COOLED HIGH TEMPERATURE REACTOR BLOWER

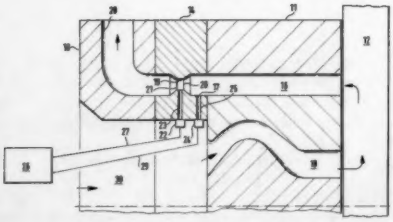
**Jurgen Kolodzey, Ketsch; Josef Schoening, Hambruecken; Hans-Georg Schwiers, Ketsch, and Wilfried Stracke, Oftersheim, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany**

**Filed Jul. 31, 1981, Ser. No. 289,089**

**Claims priority, application Fed. Rep. of Germany, Aug. 19, 1980, 3031215**

**Int. Cl.³ G01F *1/44***

**U.S. Cl. 73—861.63** **2 Claims**



1. An apparatus for measuring the flow of gas in a blower of a gas cooled high temperature nuclear reactor comprising:

a blower shield communicating with a blower;

an inlet conduit in said blower shield for conducting gas flow to said blower;

an exit conduit in said blower shield for conducting gas flow from said blower;

a venturi tube in said exit conduit, a first measuring channel communicating with the gas flow in said venturi tube, a second measuring channel communicating with the gas flow in said exit conduit upstream from said venturi tube and means for converting the relative gas flow in said first and second measuring channels into meaningful reactor information.

**4,422,341**

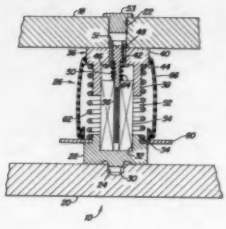
## SNAP-IN DRAFT SENSOR

**Eugenio Espiritu Santo, and Kenneth D. Baxter, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.**

**Filed Dec. 21, 1981, Ser. No. 332,577**

**Int. Cl.³ G01L *1/14, 5/13***

**U.S. Cl. 73—862.64** **5 Claims**



1. A force sensor comprising:

a deformable frame having spaced-apart portions defining an opening therebetween, and having a variable separation depending on force-induced deformation of the frame, each spaced-apart portion including a recess extending therein from the opening; and

a snap-in, spring-loaded transducer means releasably mountable in the opening for sensing variations in separation between the spaced-apart portions of the frame, the transducer means including a base member having a projection which is releasably receivable by one of the recesses, a cap member having a stub which is releasably receivable by the other of the recesses and resilient means acting between the base and the cap members and biased for releasably maintaining the projection and the stub in their respective recesses, the transducer means further comprising a linear position sensor having a first member fixed to the base member and a second member movable with respect to the first member and coupled for movement with the cap member, the cap including means for adjusting the position of the second member with respect to the first member.

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**4,422,342**

## TEMPORARY VANES TO STRAIGHTEN GAS FLOW IN SCRUBBERS

**Donald L. Smith, Bethel Park; Zenon V. Kosowski, McMurray, both of Pa., and Robert R. Marks, Jr., Fairmont, W. Va., assignors to Conoco Inc., Wilmington, Del.**

**Filed Mar. 15, 1982, Ser. No. 358,126**

**Int. Cl.³ G01N *1/22***

**U.S. Cl. 73—863.43** **5 Claims**

1. A method of flow straightening and sampling gas in the stack of a gas scrubber said gas during normal operation of the scrubber having substantially nonaxial flow so as to retain within said stack droplets carried by said gas, comprising the sequence of steps as follows:

(a) providing a plurality of flow straightening panels and a flow straightening panel support means in the chamber of the gas scrubber, said panels connected to said panel support means to form a flow straightener,

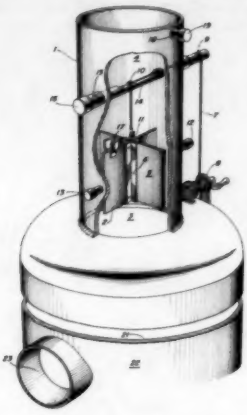
(b) providing upper lifting support means to support said flow straightener,

(c) lifting said flow straightener from said scrubber chamber into said scrubber stack using said lifting support means,

(d) providing said flow straightener with a lower safety support means to support said flow straightener in said stack,

(e) conveying gas through said scrubber stack and through said flow straightener, whereby said gas flow is straightened to more closely approximate axial flow,

(f) sampling gas in said stack after said gas has passed through said flow straightener,
(g) removing said safety support means and lowering said flow straightener into said scrubber chamber,



(h) disconnecting said panels from said panel support means and removing said panels and panel support means from said scrubber chamber,
(i) conveying gas through said scrubber stack in substantially droplet retaining nonaxial flow.

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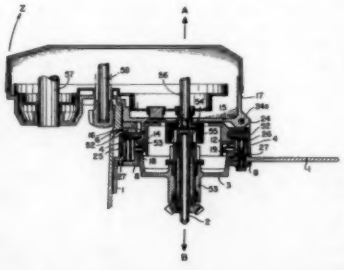
**4,422,343**

## KITCHEN APPLIANCE WITH INTERCHANGABLE ATTACHMENTS

**Günther Falkenbach, Eschborn; Dieter Seuwen, Frankfurt; Jürgen Schneider, Kronberg, and Hartwig Kahlcke, Bad Soden, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany**

**Filed Mar. 19, 1982, Ser. No. 360,074**
**Int. Cl.³ A47J *43/44***
**U.S. Cl. 74—16** **13 Claims**



1. A kitchen appliance, comprising:
a motor base;
a power takeoff shaft extending outwardly from said motor base;
a retainer ring surrounding said power takeoff shaft and rigidly secured to said motor base, said retainer ring having a plurality of radially and inwardly extending pins;
a tension ring having a circular flange portion with a plurality of recesses and a radially and outwardly extending activation arm;
a clamping ring;
means for interconnecting said tension and clamping rings to thereby form a tension ring assembly, wherein said retainer ring is clamped between said tension and clamping rings such that said tension ring assembly is rotatable about said power shaft but is substantially nondisplaceable in the longitudinal direction of said power shaft;
a tool attachment having a base with radially outward extending protrusions for extending through said tension ring recesses to secure said tool attachment to said tension ring assembly; and
a container attachment having a base with a plurality of recesses for receiving said pins to secure said container attachment to said retainer ring.

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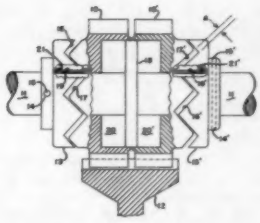
**4,422,344**

## LOAD PROPORTIONAL ANTIBACKLASH GEAR DRIVE SYSTEM

**Hermann A. Wutherich, Rancho Palos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Jul. 7, 1981, Ser. No. 281,148**
**Int. Cl.³ F16H *55/18, 57/00, 55/12***
**U.S. Cl. 74—409** **2 Claims**



1. A load proportional antibacklash single step gear drive system for transmitting to a driven gear torque applied to a rotating drive shaft which comprises:
a. a split pinion gear supported by said drive shaft, said gear having a first pinion half and a second pinion half axially spaced on said shaft, each of said halves having a first tooth means for engaging said driven gear and a second tooth means;
b. a first driving member, mounted for rotation with said drive shaft, and having tooth means for driving engagement with said second tooth means of said first pinion half;
c. a second driving member, mounted for rotation with said drive shaft, and having tooth means for backlash eliminating engagement with said second tooth means of said second pinion half in opposite rotational sense to said first driving member; and
d. means, responsive to the applied torque on said drive shaft, for urging said first pinion half into engagement with said first driving member, and for urging said second pinion half into engagement with said second driving member.

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**4,422,345**

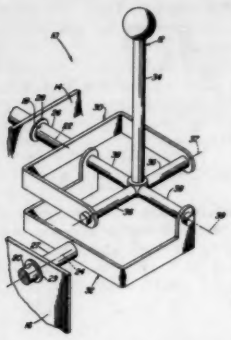
## TWO-WAY CONTROL LEVER ROTATABLE IN CAB WALL FOR SOUND SEALING

**Merlin G. Green, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.**

**Filed Sep. 11, 1981, Ser. No. 301,166**
**Int. Cl.³ G05G *9/04***
**U.S. Cl. 74—471 XY** **2 Claims**

1. A two-way control lever mounted inside a cab for controlling functions exteriorly of the cab, comprising: said cab having a wall section provided with first and second holes respectively located in first and second vertical planes intersecting within the cab; first and second shafts respectively

pivotally mounted in said first and second holes; first and second crank arms respectively fixed to said first and second shafts and having respective portions located for rotation in said second and first planes; and an upright handle having a



first lower end portion mounted in said first crank arm for rotation about a first axis located in the second vertical plane and having a second lower end portion mounted in said second crank arm for rotation about a second axis located in the first vertical plane.

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**4,422,346**

**TILTABLE STEERING MECHANISM**

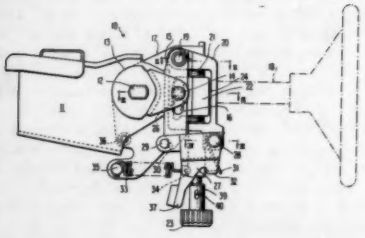
**Masumi Nishikawa, Toyoake, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Filed Jul. 14, 1981, Ser. No. 283,248**

**Claims priority, application Japan, Jul. 16, 1980, 55-10049[U]; Jul. 18, 1980, 55-102629[U]**

**Int. Cl.³ B62D *1/18***

**U.S. Cl. 74—493** **5 Claims**



1. A tiltable steering mechanism comprising a first bracket adapted to be secured a vehicle body, a second bracket for rotatably supporting a steering shaft pivotally mounted on said first bracket, a sub-bracket secured to one side of said first bracket and having pin means at one end thereof, a first pivot pin secured to second bracket substantially above said pin means, a first locking lever pivotally mounted on said first pivot pin and having an elongated slot slidably engageable with said pin means, a tilt lever pivotally mounted on said first pivot pin, a second pivot pin secured to said tilt lever in spaced relation to said first pivot pin, a second locking lever pivotally supported on said second pivot pin, complementary locking means on said first and second locking levers for normally holding said tilt lever adjacent said first locking lever and latch means adjustably mounted on said tilt lever for movement toward and away from said first pivot pin and engageable with said pin means to hold said second bracket in adjusted position relative to said first bracket.

**4,422,347**

**TORSIONAL BALANCER DEVICE WITH A VISCOUS DAMPING MEDIUM**

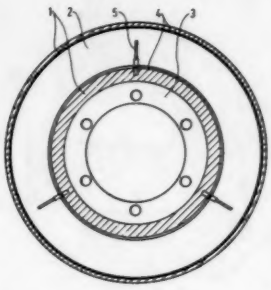
**Joachim Conseur, Berlin, Fed. Rep. of Germany, assignor to Carl Hasse & Wrede GmbH, Berlin, Fed. Rep. of Germany**

**Filed May 29, 1981, Ser. No. 268,264**

**Claims priority, application Fed. Rep. of Germany, Jun. 3, 1980, 3020993**

**Int. Cl.³ F16F *15/10***

**U.S. Cl. 74—574** **8 Claims**



1. A torsional balancer device for a rotary shaft and the like, comprising a rotationally symmetrical member having means thereon for connecting said member to a rotary shaft to be balanced, a rotationally symmetrical seismic mass rotatably mounted closely spaced from said rotational member and defining gap spaces therebetween, a viscous damping agent in said gap spaces, and a plurality of curved, substantially closed spring elements, each having closely spaced ends connected respectively to said rotational member and said seismic mass, said ends of each spring element are disposed in an axial plane of the balancer and are directed toward each other.

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**4,422,348**

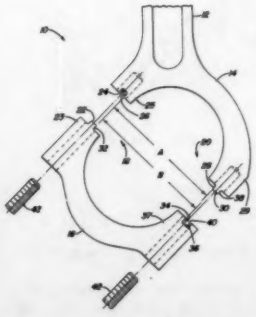
**CONNECTING ROD**

**Gary L. Campbell, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.**

**Filed Sep. 27, 1982, Ser. No. 423,756**

**Int. Cl.³ G05G *1/00***

**U.S. Cl. 74—579 E** **1 Claim**



1. In a connecting rod having a shank, a head and a cap joined to the head by a pair of tongue and groove connections, the improvement wherein one of the connections is comprised of a press-fit connection and the other connection is comprised of a snap-fit connection, the connection farthest from the shank being the snap-fit connection, the head having first and second

arms, an end of the first arm being nearer the shank than an end of the second arm, the end of the first arm having a groove which receives in a press-fit manner a tongue which extends from a corresponding first arm of the cap, the end of the second arm having a tongue extending therefrom for insertion into a corresponding groove in a corresponding second arm of the cap, the groove in the second cap arm having a width which is greater than the width of the tongue of the second head arm, the groove and tongue of the cap having a separation which is greater than the separation of the groove and tongue of the head.

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**4,422,349**

## TORQUE TRANSFER DEVICE FOR A FOUR WHEEL DRIVE VEHICLE

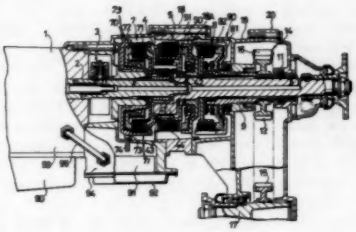
**Gohichi Matsumoto, Okazaki, and Yohichi Hayakawa, Toyoake, both of Japan, assignors to Aisin Warner Kabushiki Kaisha, Aichi, Japan**

**Filed Nov. 18, 1980, Ser. No. 207,836**

**Claims priority, application Japan, Nov. 26, 1979, 54-153277**

**Int. Cl.³ F16H** *37/06, 57/10*

**U.S. Cl. 74—665 GE** **10 Claims**



1. A torque transfer device for a four wheel drive vehicle having front and rear axles, comprising:

an input shaft receiving torque from a gear transmission;

a first output shaft rotatably coupled with either one of said front and rear axles;

a second output shaft rotatably coupled with the other one of said axles;

a planetary gear set including a sun gear, a ring gear, a planetary pinion, and a planetary pinion carrier, said sun gear being coupled with said input shaft, said carrier being coupled with said first output shaft;

friction brake means for selectively and reversibly engaging said ring gear of said planetary gear set with a stationary portion of said torque transfer device;

first friction clutch means for selectively and reversibly engaging said planetary pinion carrier and said sun gear of said planetary gear set with each other;

a linkage mechanism including a sleeve rotatably mounted on said first output shaft, and a rotation transmitting mechanism provided between said sleeve and said second output shaft, and

second friction clutch means between said first output shaft and said sleeve for selectively and reversibly engaging said sleeve and said output shaft with each other,

whereby torque received at said input shaft is deliverable at said first and second output shafts simultaneously when said second friction clutch means is engaged and only at said first output shaft when said second friction clutch means is disengaged.

**4,422,350**

## GEAR SHIFT CONTROL IN MOTOR VEHICLES WITH AUTOMATIC TRANSMISSIONS

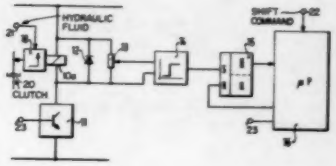
**Alfred Muller, Leonberg; Gerhard Eschrich, Gerlingen, and Achim Schreiber, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Feb. 18, 1981, Ser. No. 235,523**

**Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3010865**

**Int. Cl.³ F16H** *3/44*

**U.S. Cl. 74—753** **5 Claims**




1. Automatic transmission control system for use in an automotive vehicle having

friction elements (**20**);

electrical current controlled hydraulic pressure regulator means (**10**) having a solenoid winding through which electrical current passes in operation, operating the friction elements;

control means (**22, 16, 23**) for controlling the pressure regulator means for disengagement, and engagement, of the friction elements of an engaged gear and a newly selected, to be engaged gear, respectively, to overlapping engagement with said friction elements, during shifting between the gears;

a threshold circuit (**14**) sensing an electrical signal pulse appearing across the solenoid winding upon changing of state of the friction element associated with the newly selected, to be engaged gear representative of when a hydraulic unit of the newly selected, to be engaged gear is filled;

and connection means (**15**) connecting said signal pulse to said control means (**22, 16, 23**), said control means controlling overlap over disengagement, and engagement of the friction elements of the engaged, and newly selected, to be engaged gear in response to said signal pulse.

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**4,422,351**

## TRACTION ROLLER TRANSMISSION

**Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.**

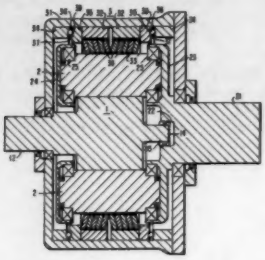
**Filed Jul. 10, 1981, Ser. No. 281,983**

**Int. Cl.³ F16H** *13/06, 13/00*

**U.S. Cl. 74—798** **7 Claims**

1. A traction roller transmission comprising a traction ring structure having inner traction surfaces, a sun roller centrally disposed within the traction ring structure and having a circumferential traction surface spaced from the traction surface of said traction ring structure, planetary traction rollers supported in the space between the sun roller and the traction ring structure, and engagement means for forcing said traction rollers into frictional engagement with said traction ring structure and said sun roller; wherein at least one of said traction surfaces is formed by a stack of Belleville-type spring rings, and means are provided for axially compressing said Belleville-type spring rings when a torque is transmitted through said transmission so as to cause radial expansion of the spring rings for firm frictional engagement of said spring rings with the

adjacent traction rollers, said spring rings having adjacent said planetary traction rollers radial end surfaces curved in the axial



direction of the sun roller and providing rolling contact with said planetary traction rollers.

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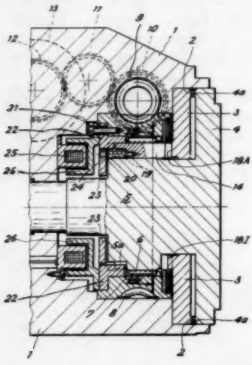
**4,422,352**

**APPARATUS FOR ROTATING IN EITHER DIRECTION A TURRET THAT CARRIES PLURAL TOOL HOLDERS**

**Pier C. Boffelli, Milan, Italy, assignor to Baruffaldi Frizioni S.p.A., Milan, Italy**

**Filed Oct. 20, 1981, Ser. No. 313,187**
**Claims priority, application Italy, Oct. 23, 1980, 25537 A/80**
**Int. Cl.³ B23B *29/24***
**U.S. Cl. 74—813 L** **5 Claims**



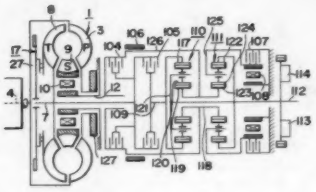
1. A rotary turret comprising a rotatable tool post body having a hub, a plurality of blocks carried by the hub for sliding movement relative to the hub in a direction parallel to the axis of rotation of the hub, a fixed member having slots into which said blocks are selectively insertable, an electromagnet, a keeper juxtaposed to said electromagnet and secured to said blocks, the keeper approaching the electromagnet when the blocks leave the slots and receding from the electromagnet when the blocks enter the slots, means urging the blocks toward the slots, the spacing between the keeper and the electromagnet being such that the electromagnet can retain the keeper against movement away from the electromagnet only when the blocks are out of the slots, and means for rotating the hub in either direction.

**4,422,353**

**LOCK-UP CONTROL METHOD OF AND SYSTEM FOR AUTOMATIC TRANSMISSION FOR AUTOMOTIVE VEHICLE HAVING ENGINE PROVIDED WITH FUEL CUT MEANS**

**Masaaki Suga, Yokohama; Yoshiro Morimoto, Yokosuka; Hideo Hamada, Yokosuka; Masaaki Futagi, Yokosuka, and Tadashi Suzuki, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Oct. 5, 1981, Ser. No. 308,663**
**Claims priority, application Japan, Oct. 3, 1980, 55-137718**
**Int. Cl.³ B60K *41/02, 41/18***
**U.S. Cl. 74—858** **10 Claims**



1. A control system for a lock-up type automatic transmission for an automotive vehicle having an engine and an accelerator pedal, the lock-up type automatic transmission having a lock-up type torque converter, the engine having fuel cut means for suspending the supply of fuel to the engine after the accelerator pedal has been released to cause the automotive vehicle to begin a coasting operation, the suspension of the supply of fuel to the engine being kept as long as the engine operates in a predetermined state which allows the engine to resume combustion to operate again upon resumption of the supply of fuel to the engine, said control system comprising:

means for forcing the lock-up type torque converter to lock up at least when the engine operates in the predetermined state,

means for supplying fuel to the engine when the engine operates in a second predetermined state, and

means for releasing the lock-up of the lock-up torque converter only after a predetermined condition after the fuel is supplied to the engine by said fuel supplying means.

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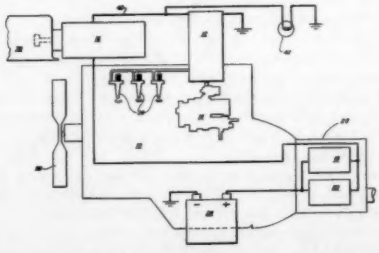
**4,422,354**

**ENGINE OVERHEAT PROTECTION SYSTEM FOR DUAL HORSE POWER ENGINE**

**Larry L. Bandy, Springfield, Ill., assignor to Fiat Allis North America, Inc., Deerfield, Ill.**

**Filed Jan. 29, 1982, Ser. No. 344,198**
**Int. Cl.³ B60K *41/06;* F02M *39/00***
**U.S. Cl. 74—860** **11 Claims**



1. A system for controlling horsepower of an internal combustion engine having means for circulating coolant therethrough and a variable speed transmission connected to a work

load comprising temperature sensitive means disposed in a portion of said means for circulating coolant responsive to changes in temperature of the engine coolant, pump means providing a source of fuel for said engine, fuel valve means receiving fuel from said pump means adaptable to selectively supply fuel to said engine in accordance with the requirements of said work load, speed sensitive means disposed in said transmission responsive to changes therein due to fluctuations of the work load, a source of electrical power for supplying current to said speed sensitive means, said speed sensitive means being electrically connected in series to said temperature sensitive means and said fuel valve means, said fuel valve means being effective upon receiving a signal from said speed sensitive means to increase the supply of fuel to said engine when said transmission is shifted from a lower to a higher speed range and thereby increase horsepower output of the engine.

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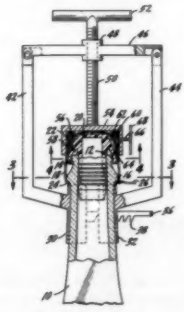
**4,422,355**

## SPARKLING WINE BOTTLE OPENER

**William T. Burns, Jr., 175 E. Delaware Pl., Apt. 6017, Chicago, Ill. 60611**

**Filed Apr. 13, 1981, Ser. No. 253,673**
**Int. Cl.³ B67B *7/02***
**U.S. Cl. 81—3.36** **2 Claims**



1. Means for controllably removing a bottle stopper from a bottle containing a liquid and natural high pressure gas, such as a sparkling wine, in which the stopper is held in place, at least in part, by a wire hood, including a pair of oppositely-positioned clamping members, each having a generally curved surface for gripping the bottle adjacent the pouring lip, but free of the wire hood, means for moving said clamping members toward and away from an intermediately positioned bottle, means for gripping the stopper, which means permits a loosening of the wire hood, including a cup-shaped member having movable interior gripping means, a threaded member mounted upon said clamping members, said cup-shaped member being mounted upon said threaded member for movement toward and away from the stopper, and means for applying an axial turning movement to said cup-shaped member to slowly move it relative to the clamping members and remove the stopper and permit the controlled release of gas from within the bottle after the wire hood has been loosened and while maintaining the clamping members in clamping engagement with the bottle adjacent the pouring lip.

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**4,422,356**

## CUTTING TOOL BIT HOLDER

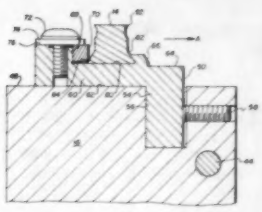
**John E. Pertle, Garden Valley, Calif., assignor to Tri Tool Inc., Rancho Cordova, Calif.**

**Filed Jun. 15, 1982, Ser. No. 388,709**
**Int. Cl.³ B23B *29/04***
**U.S. Cl. 82—36 R** **10 Claims**

1. A cutting tool holder for removably holding a cutting tool bit on a machine tool support fixture arranged to receive the holder in an axially extending opening of the fixture and to carry same about a circular orbital path for performing a surface cutting operation on a workpiece, comprising:

a generally L-shaped holder base including a proximal first leg shaped to enable it to be mounted within a corresponding, axially extending opening of a machine tool support fixture and a second leg extending perpendicular to the first leg and in a direction extending away from the cutting direction of the tool bit, said second leg including a distal surface disposed on the side thereof opposite the side from which the first leg extends;

a female dovetail gib, and a stop surface extending parallel to and spaced away from female gib disposed on said distal surface, the gib and stop surface extending upwardly from the distal surface;



a clamp bar having a pair of opposed generally parallel surfaces, the clamp bar disposed with one of said surfaces contiguous with said stop surface and with the opposite surface facing towards but spaced apart from the bit to define a tool bit receiving slot along the distal surface between the bit and said opposite surface;

said clamp bar including a lower surface adjacent said distal surface, said opposite surface including a cam surface sloped towards said bottom surface and said surface contiguous with said stop surface, whereby said cam surface and female gib form a pair of female gibs for receiving a pair of male gibs presented on a tool bit locatable in said tool bit receiving slot;

removable fastener means retaining said clamp bar adjacent said stop surface and urging same towards said distal surface.

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**4,422,357**

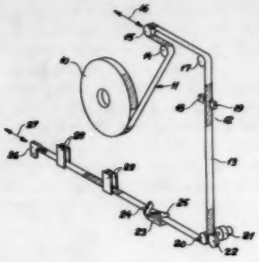
## APPARATUS FOR ADVANCING A PREDETERMINED LENGTH OF STRIP-SHAPED MATERIAL

**Mogens D. Larsen, Teglvaerksvej 22, DK-4450 Jyderup, Denmark**

**PCT No. PCT/DK80/00061, § 371 Date Jun. 11, 1981, § 102(e) Date Jun. 11, 1981, PCT Pub. No. WO81/00999, PCT Pub. Date Apr. 16, 1981**
**PCT Filed Oct. 13, 1980, Ser. No. 276,371**
**Claims priority, application Denmark, Oct. 15, 1979, 4346/79**
**Int. Cl.³ B26D *5/32***
**U.S. Cl. 83—210** **6 Claims**

1. An apparatus for advancing a predetermined length of strip-shaped material from a supply roll to a delivery point, comprising: a pull-off mechanism having a reciprocable pull-off means over which the strip runs, a one-way means through which the strip runs, said one-way means being disposed between said mechanism and the delivery point, a gripper arranged to be reciprocated in synchronism with said pull-off means and, at its one extreme position, to grip the end of the

strip of material, a strip brake, and a detector arranged to detect a mark on the strip and in response thereto cause the gripper to open so as to release the strip, and said strip brake to be actuated.



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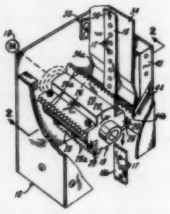
**4,422,358**

## APPARATUS FOR CUTTING A CONTINUOUS NARROW STRIP INTO SHORT SECTIONS

**Harvey C. Hull, Kettering, and Robert W. Henz, Sr., Dayton, both of Ohio, assignors to The Standard Register Company, Dayton, Ohio**

**Filed Apr. 6, 1981, Ser. No. 250,230**
**Int. Cl.³ B26D *1/38***
**U.S. Cl. 83—356.3** **4 Claims**



1. Apparatus for cutting a continuously moving continuous strip into short sections, comprising:

a housing,

a yoke supported within the housing and rotatable about a generally horizontal axis, the axis of rotation of the yoke being at a given elevational level within the housing, the yoke having a plurality of radially extending lobes,

a plurality of first blades, there being a first blade attached to each of the lobes of the yoke and movable with rotation of the yoke, each of the first blades having a substantially horizontal row of teeth, each of the teeth having a protruding cutting edge,

a stationary blade positioned within the housing adjacent the yoke, the upper surface of the stationary blade having a portion above the axis of rotation of the yoke and sloping downwardly toward the yoke, the stationary blade having a lower end portion closely adjacent the yoke and at substantially the same elevational level within the housing as the axis of rotation of the yoke, the stationary blade having a horizontal row of teeth as the lower end portion thereof, each of the teeth of the stationary blade having a cutting edge which is substantially vertical,

an elongate guide member oriented substantially vertically within the housing and supported at a position substantially above the yoke and the stationary blade, the elongate guide member having a resilient portion extending downwardly from the position of support thereof, the elongate guide member having a lower end portion which is positioned generally above the lower end portion of the stationary blade and closely adjacent thereto,

the yoke rotating in a direction so that the first blades travel downwardly toward the stationary blade and the teeth of the first blades mesh with the teeth of the stationary blade as the yoke rotates,

a continuous strip traveling downwardly within the housing and being guided by the elongate guide member to a position adjacent the lower end portion of the stationary blade, the first blades engaging a part of the continuous strip and urging said part of the continuous strip into engagement with the lower end portion of the guide member as the yoke rotates, the strip being directed by the guide member to a position between the teeth of the stationary blade and the teeth of a first blade and being severed by the teeth of the first blade and the teeth of the stationary blade as the yoke rotates.

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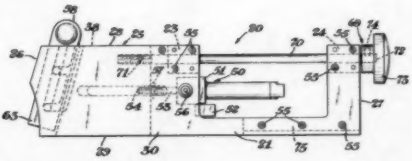
**4,422,359**

## ADJUSTABLE SLITTER BLADE HOLDER

**William E. Leboeuf, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Filed Oct. 7, 1981, Ser. No. 309,314**
**Int. Cl.³ B26D *1/03***
**U.S. Cl. 83—546** **10 Claims**



1. A slitter blade carrier which comprises, in cooperative combination:

(a) a frame;

(b) a blade holder which is in slideable engagement with, and which is contained within the frame, the blade holder comprising a sliding block, the sliding block being in slideable engagement with the frame, in cooperative combination with a blade guide member, the blade guide member being in slideable engagement with the sliding block, said sliding block having a first end and a second end, the sliding block also having defined therein a generally angularly disposed recess, a first generally angularly disposed slot and a second generally angularly disposed slot, the first slot and the second slot being generally parallel to each other and to the recess, the first slot and the second slot further being in communication with the recess;

(c) an actuator means for causing the blade carrier to move slideably within the frame, said actuator means being connected to the frame and to the blade holder; and

(d) a blade engagement adjustment means, said adjustment means being operatively connected to the frame and to the blade holder.

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**4,422,360**

## DEVICE FOR IMPROVING PIANO TONE QUALITY

**Barry E. Carter, 1721 10th Ave., San Francisco, Calif. 94122**

**Continuation-in-part of Ser. No. 82,740, Oct. 9, 1979, abandoned. This application Aug. 25, 1981, Ser. No. 296,000**
**Int. Cl.³ G10H *3/00***
**U.S. Cl. 84—1.11** **9 Claims**

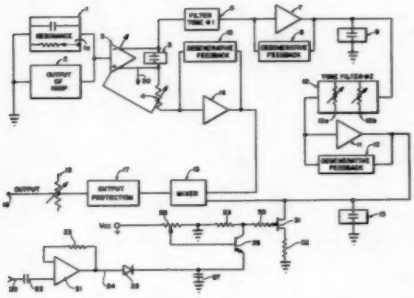
1. In a device for controlling the tone quality put out by an electronic piano characterized by a harp for producing vibratory signals and by inductive transducers configured to detect said vibratory signals and convert them into electrical signals, an improved circuit interposed between said piano and subse-

quent amplifier and loudspeaker means, said circuit being characterized by a main signal path carrying fundamental tones of the piano and having a substantially flat frequency response throughout the audible spectrum above a predetermined low frequency, and by an overtone signal path having three separate bands, a bass boost band below a predetermined first frequency and a treble boost band above a predetermined second frequency higher than said predetermined first frequency with amplitude boosted tones therein, and a midrange null band between said bass boost band and said treble boost band with amplitude nulled tones therein, said circuit comprising:

input means for connecting to said transducers and receiving said electrical signals;

first amplifier means connected to said input means, for amplifying said electrical signals and for providing one output to said main signal path, and another output to said overtone signal path;

second amplifier means connected to said first amplifier means in said main signal path for amplifying said tones passing through said main signal path and including amplitude control means for controlling the amplitude in said main signal path;



tone filter network means connected to said first amplifier means in said overtone signal path, for passing tones in said bass boost band and said treble boost band and for nulling tones in said midrange null band;

third amplifier means connected to said tone filter network means in said overtone path, for amplifying the tones in said bass boost band and said treble boost band by a controlled amount and having control means for controlling the amplification of tones in said bass boost band and in said treble boost band;

mixer means connected to said second amplifier means in said main signal path and to said third amplifier means in said overtone path for combining said tones from said paths in proper phase relationship into a single composite signal and for providing an output to said subsequent amplifier and loudspeaker means;

gate control means having an input connected to said output to said main channel of said first amplifier means and to said mixer means, for disabling said overtone path at the input to said mixer means whenever the signal level in said main signal path is below a predetermined threshold amplitude level.

**4,422,361**

## ELECTRONIC MUSICAL INSTRUMENT

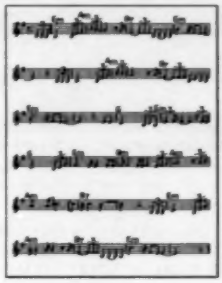
**Hiroshi Ishii, Tachikawa, and Hideaki Ishida, Hachioji, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan**

**Filed Jun. 17, 1981, Ser. No. 274,529**

**Claims priority, application Japan, Jun. 20, 1980, 55-83582; Jun. 20, 1980, 55-83583; Jun. 20, 1980, 55-83585**

**Int. Cl.³ G10H *3/06*; G10B *15/00***

**U.S. Cl. 84—1.18** **8 Claims**



1. A bar code recording and reproducing system comprising:

a medium on which is recorded bar code information which includes at least code table areas containing a plurality of code data, table reference areas containing a plurality of symbol data corresponding to respective ones of said code data arranged in a given sequence, and separator areas containing separator information and separating said code table areas from said table reference areas;

a bar code reader for reading said bar code information recorded on said medium;

discriminating means coupled to said bar code reader for discriminating code data information of said code table areas and symbol data information of said table reference areas by detecting separator information of said separator areas among the information read out by said bar code reader; and

converting means coupled to said discriminating means and responsive to said information read out by said bar code reader for converting said plurality of symbol data read out from said table reference areas into a corresponding plurality of code data arranged in said given sequence according to the result of discrimination performed by said discriminating means.

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**4,422,362**

## ELECTRONIC MUSICAL INSTRUMENT OF A FORMANT SYNTHESIS TYPE

**Masanobu Chibana, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan**

**Filed Sep. 10, 1981, Ser. No. 300,993**

**Claims priority, application Japan, Sep. 19, 1980, 55-129164**

**Int. Cl.³ G10H *1/06, 7/00***

**U.S. Cl. 84—1.19** **15 Claims**

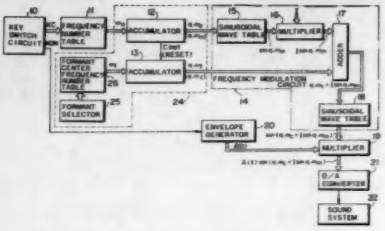
1. An electronic musical instrument comprising:

note selection means for selecting a note among a plurality of notes;

phase generation means for generating phase angle data whose value varies at rate corresponding to a center frequency of a fixed formant, said fixed formant center frequency being independent of the frequency of the note selected by said note selection means;

reset means for repeatedly resetting the value of said phase angle data to a predetermined value with a frequency corresponding to the fundamental frequency of said se-

lected note, said resetting continuing repeatedly while said note remains selected; and




frequency modulation means for frequency-modulating said phase angle data according to a modulation signal and outputting a frequency modulated signal as a tone signal.

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**4,422,363**

## METHOD FOR DIGITALLY CONTROLLING THE ENVELOPE CURVE IN A POLYPHONIC MUSICAL SYNTHESIZER AND CIRCUITRY TO IMPLEMENT THE METHOD

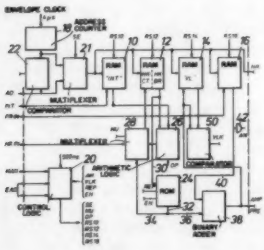
**Christian J. Deforeit, Trossingen, Fed. Rep. of Germany, assignor to Matth. Hohner AG, Trossingen, Fed. Rep. of Germany**

**Filed Jun. 23, 1981, Ser. No. 276,685**

**Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023581**

**Int. Cl.³ G10H *1/02***

**U.S. Cl. 84—1.26** **8 Claims**




1. A method for digitally generating envelope curves for the sounds to be produced by a polyphonic electronic musical instrument comprising the steps of:

permanently storing a plurality of envelope curve samples, each stored curve sample being comprised of bits of value information which define a sound;

storing the addresses of those of the stored curve samples which are commensurate with the individual sounds to be produced

sequentially reading the stored curve sample addresses;

reading a stored curve sample at a first rate of speed when its stored address is read;

storing the instantaneous value information of the envelope curve sample presently being read;

generating a curve change command when it is desired to change from producing the sound commensurate with the present envelope curve sample which is being read to a sound commensurate with another envelope curve;

sampling the said another envelope curve sample at a second rate of speed in response to the generation of a curve change command, the second rate of speed being greater than the first rate of speed;

comparing the stored instantaneous value information of the present envelope sample curve with the value information of the said another envelope curve during sampling thereof;

initiating reading of the said another envelope curve sample when the comparison indicates that the value information of the said another curve has equaled the stored value information of the present curve; and

delivering the envelope curve sample being read to modulation controls in an instrument.

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**4,422,364**

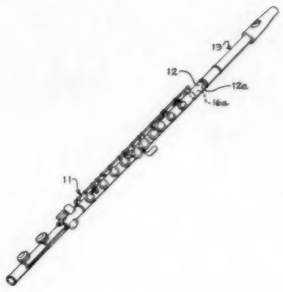
## FIPPLE TYPE HEADJOINT ASSEMBLY FOR USE WITH EXISTING TRANSVERSE FLUTES

**Joseph R. La Volpa, 435 Bosley St., P.O. Box 369, Santa Rosa, Calif. 95402**

**Continuation of Ser. No. 117,527, Jan. 31, 1980, abandoned. This application Jul. 10, 1981, Ser. No. 282,143**

**Int. Cl.³ G10D *7/02***

**U.S. Cl. 84—384** **2 Claims**



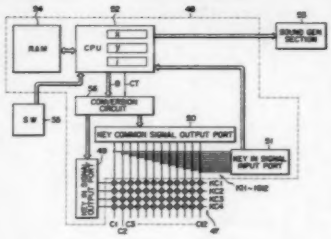

1. A fipple headjoint construction for a flute comprising an elongate metal tubular member, one end of said tubular member including an elongate air passage formed through the side wall of said tubular member, a non-metallic fipple mouthpiece element having a wind opening therein formed through the side wall of said mouthpiece element, said element being mounted onto said one end of said tubular member, said one end being inserted into said mouthpiece to a degree at least co-extensive with the position of said wind opening to form a metal liner within said mouthpiece, said mouthpiece element including an elongate flow passage having outer and inner ends thereof and extending from the outer end of the mouthpiece element to said inner end of the flow passage, said inner end of said flow passage being disposed adjacent said inserted end of said tubular member, an air deflection wedge disposed in confronting spaced relation to the inner end of said flow passage, said wind opening being disposed between said inner end of said flow passage and said wedge for permitting a portion of the entering air to escape through said wind opening, said elongate air passage formed through the side wall of said one end of said tubular member extending along said member to a position substantially beyond said wedge to provide a metallic liner within said mouthpiece element, said wedge serving to deflect a first portion of the entering air to pass downwardly into said tubular member and against said liner via said elongate air passage and for deflecting a second portion of the entering air to discharge upwardly and outwardly via said wind opening to initiate sound waves into the flute.

4,422,365

## DRIVE CONTROL SYSTEM FOR DISPLAY DEVICES

Shunichi Iwaki, Kodaira, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1981, Ser. No. 331,159
Claims priority, application Japan, Dec. 24, 1980, 55-184383; Dec. 24, 1980, 55-184384; Jul. 2, 1981, 56-103924
Int. Cl.³ G09B 15/08; G06F 3/02
U.S. Cl. 84—478 12 Claims




1. An electronic musical instrument having a plurality of operation keys and display devices provided for said respective operation keys, comprising:

matrix wiring means coupled to said operation keys and including intersecting row lines and column lines for wiring said plurality of operation keys in a matrix;

wiring means coupled to said display devices for connecting display devices corresponding to said plurality of operation keys to said row lines and column lines of said matrix wiring means at the intersections of said row lines and column lines of said matrix;

scanning signal generating means coupled to said matrix wiring means for supplying a scanning signal to said matrix wiring means for scanning said plurality of operation keys; and

drive signal generating means coupled to said matrix wiring means for supplying a drive signal to said matrix wiring means for selectively turning one said display devices.

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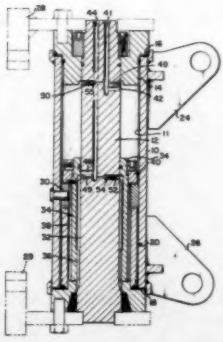
4,422,366

## ROTARY HELICAL ACTUATOR

Paul P. Weyer, 48811 284th Ave. SE., Enumclaw, Wash. 98022

Filed Oct. 16, 1981, Ser. No. 312,091
Int. Cl.³ F15B 15/22; F01B 3/00
U.S. Cl. 91—26 8 Claims



1. A rotary actuator comprising a cylinder, a shaft rotatably mounted within said cylinder for relative rotation between the shaft and the cylinder, linear-to-rotary motion conversion means between the shaft and cylinder, said motion conversion means including a piston, means for selectively introducing pressurized fluid to alternative sides of said piston for reciprocating the piston and producing said relative rotation, and bearing means for carrying the radial and bending loads between the shaft and cylinder, said bearing means including a cylindrical bearing sleeve joined to said shaft extending along the length of the shaft inward of said cylinder, and spaced radially from the outer surface of the shaft to define an operating chamber for receiving the motion conversion means, and said bearing sleeve having a radially outer bearing surface in engagement with the inner surface of the cylinder.

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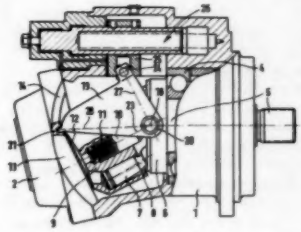
4,422,367

## AXIAL PISTON MACHINE HAVING INCLINED AXIS CONSTRUCTION WITH SWIVEL CARRIAGE AND ADJUSTING ARRANGEMENT

Heinz Berthold, Bildechingen, Fed. Rep. of Germany, assignor to Brueninghaus Hydraulik GmbH, Fed. Rep. of Germany

Filed Aug. 13, 1981, Ser. No. 292,521
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030637
Int. Cl.³ F01B 13/04
U.S. Cl. 91—484 11 Claims



1. An axial piston machine having a variably inclined rotational axis, said machine comprising:

(a) a cylindrical drum pivotably mounted within a housing, said drum having a plurality of reciprocating pistons mounted therein;

(b) a drive shaft and flange member for rotating said cylindrical drum and reciprocating said pistons;

(c) a swivel carriage mounted for reciprocal movement in said housing, said swivel carriage displaceable from a first position aligned with said drive shaft to a second position angularly displaced from said shaft, said swivel carriage defining pressure and suction passageways that communicate with said pistons as said drum is rotated;

(d) a displaceable setting element mounted in said housing for controlling the angle of displacement for said swivel carriage between said first position and said second position;

(e) a tray shaped member supported by said housing on either side of said cylindrical drum to partially encompass said drum, said tray shaped member having a first projection engaging said swivel carriage along the outer edge of said carriage, said tray shaped member also including a second projection which engages said setting element for adjusting said carriage in response to movements of said setting element.

4,422,368

## CYLINDER-PISTON ARRANGEMENT

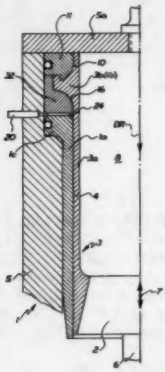
Bernhard Frey, Schaffhausen, Switzerland, assignor to Hydrowatt Systems Limited, Great Britain

Continuation of Ser. No. 138,698, Apr. 9, 1980, abandoned. This application Nov. 8, 1982, Ser. No. 439,906

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1979, 2914695

Int. Cl.³ F01B 19/00

U.S. Cl. 92—105 9 Claims



1. An apparatus comprising a piston and a cylinder, said piston being in part located in said cylinder and said piston and said cylinder being relatively movable, an elastic sealing element sealingly engaging said piston and said cylinder at spaced locations and at least partially defining a working chamber, said sealing element having a surface portion bearing against a bearing surface via a lubricant space, a first part of said bearing surface comprising a transition surface section extending oblique to the axis of said cylinder and a second part of said bearing surface comprising a cylindrical surface parallel to the axis of said cylinder, said sealing element having a radially thickened section mounted on a part of said transition surface section, and means for feeding lubricant between said oblique transition surface section and said sealing element, said means comprising a lubricant feed mouth located immediately adjacent a part of said transition surface section which is aligned approximately normal to the axis of said cylinder and radially outwardly from said cylindrical surface and opening radially inwardly, said transition surface section at least partially comprising a surface of a separate annular body, the apparatus further comprising an annular spacer ring located radially outward of said separate annular body and in facing relation thereto, said lubricant feed mouth comprising an annular recess formed in said annular spacer ring or in said transition surface section.

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4,422,369

## METHOD AND APPARATUS FOR STERILIZING A GAS, AND DEVICE FOR CONDITIONING AND PROTECTING A ZONE FROM A SPACE

Willy Smets, Uccle, Belgium, assignor to E.N.I. Electrische Nijverheidsinstallaties and E.N.I. l'Electro navale et industrielle, both of Aartselaar, Belgium

Continuation of Ser. No. 149,713, May 14, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 430,887

Claims priority, application Luxembourg, May 18, 1979, 81292

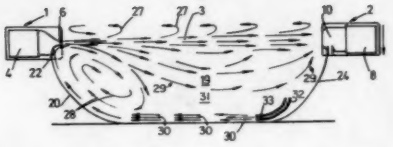
Int. Cl.³ F24F 9/00; A61G 13/00

U.S. Cl. 98—36 9 Claims

1. A method of conditioning and protecting a particular part of a preselected zone, said part being one in which a manipulation is to be effected, against contaminating agents entering from the outside environment, said method comprising:

providing a substantially laminar stream of an essentially sterile gas which has an upstream end and a downstream end, said laminar stream forming a gas curtain that defines one boundary side of the preselected zone;

delivering into said particular part of said zone a substantially continuous flow of an essentially sterile conditioned gas, said flow being adjacent the boundary of said zone remote from said gas curtain and in a direction opposite to that of said laminar gas stream and being at a preselected speed adjusted relative to the speed of the laminar gas stream;



and deflecting said flow arcuately toward the upstream end of said laminar stream to produce an interaction between said flow and said stream which directs said flow along said stream toward the downstream end and thus controls intrusion of said laminar stream into said zone and generates above said part of said zone a very slow, substantially stable circulation of gas which is continuously renewed at a low speed by said flow of sterile conditioned gas and by an exchange between gas from the flow and gas from the laminar stream.

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4,422,370

## METHOD TO RECOVER HEAT FROM TREATMENT PREMISES AND APPARATUS FOR ACHIEVING THE METHOD

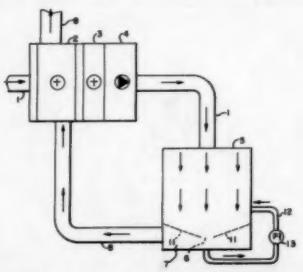
Roy Gustavson, Vaxio, Sweden, assignor to Flakt Aktiebolag, Nacka, Sweden

Filed Jun. 2, 1981, Ser. No. 269,691

Claims priority, application Sweden, Jun. 5, 1980, 80041866

Int. Cl.³ B05C 15/00

U.S. Cl. 98—11.5 SB 12 Claims



1. A method of recovering heat from treatment premises where relatively warm air is exhausted and relatively cold supply air enters into the said premises, comprising the steps of contacting the exhausted air with a liquid heat-exchange medium in a heat-absorption are adjacent the ventilation outlet of the premises, separating the liquid heat-exchange medium from the exhausted air and recirculating at least one part of the liquid medium from said area to a heat exchanger for recovery of heat, warming the supply air with the heat recovered from said liquid heat-exchange medium by a said heat exchanger, and returning said one part to said heat-absorption area, and recirculating a second part of said liquid medium from said

area directly back to said area at a rate of flow to assure optimum heat absorption in said area.

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**4,422,371**

## AERATED DRINKS MACHINE

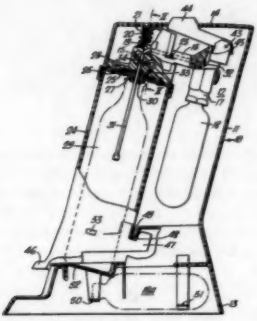
**Robert P. Child, Cosham, and Barry G. Charles, Rowlands Castle, both of England, assignors to Thorn Emi Domestic Electrical Appliances Limited, London, England**

**Filed Feb. 22, 1982, Ser. No. 350,740**

**Claims priority, application United Kingdom, Feb. 24, 1981, 8105758; Jun. 5, 1981, 8117220**

**Int. Cl.³ B01F** *3/04*

**U.S. Cl. 99—323.1** **8 Claims**



**1.** An appliance for making an aerated beverage, said appliance comprising a casing, a connection carried by said casing for mounting a container of pressurized liquid carbon dioxide, a shatterproof housing for a bottle of water, a nozzle within said housing, a stopper for engaging in the neck of a bottle, means for supporting the bottle in said housing so that the stopper is engaged therein, a safety pressure valve connected to the interior of the bottle when the stopper is engaged in its neck, and a pivotal mounting for the shatterproof housing on the casing mounting the housing for pivotal movement between a first position in which the bottle can be introduced into or removed from the housing and a second position in which the means for supporting the bottle engage the bottle to prevent its removal, said shatterproof housing also being axially reciprocable relative to the casing in addition to its pivotal movement.

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**4,422,372**

## FOOD EXTRUDER

**Doug Hoezee, Fremont, Mich., assignor to Gerber Products Company, Fremont, Mich.**

**Filed Nov. 12, 1981, Ser. No. 320,288**

**Int. Cl.³ A47J** *27/18*

**U.S. Cl. 99—353** **9 Claims**

**1.** A food extruder including:

an extruder plate having an inside surface, and outside surface and at least one perforation between the surfaces;

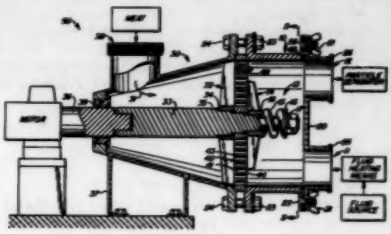
means for advancing food toward the inside surface of the extruder plate and through the perforations in the extruder plate;

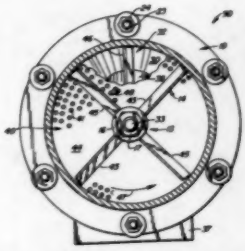
means adjacent a surface of the extruder plate for cutting the food as it passes through the perforation;

means for propelling a fluid past the outside surface of the extruder plate to carry the cut food away from the extruder plate;

the fluid propelling means including a housing mounted to overlie the outside surface of the extruder plate, the housing having a fluid inlet and a fluid and portion outlet, whereby a fluid path from the inlet, across the outside surface of the extruder plate, and through the outlet is provided; and

means for heating said fluid.





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**4,422,373**

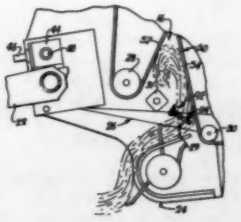
## THROAT CONTROL APPARATUS IN AN OPEN THROAT, ROTARY BALER

**Melvin V. Gaeddert, Newton, Kans., assignor to Hesston Corporation, Hesston, Kans.**

**Filed Aug. 31, 1981, Ser. No. 297,969**

**Int. Cl.³ B30B** *5/04*

**U.S. Cl. 100—88** **10 Claims**



**1.** In a rotary baler having an internal chamber in which crop material is coiled into a cylindrical bale by coacting,

oppositely moving surfaces respectively directed generally toward and away from an open non-compactive crop supply throat leading to and communicating with said chamber, the improvement comprising:

a one-way control gate operably associated with said throat, and

means mounting said gate for moving actuation by incoming crop material from a first position partially spanning the throat to an open position blocking retrograde crop flow from the chamber while permitting inwardly directed crop flow thereto.

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**4,422,374**

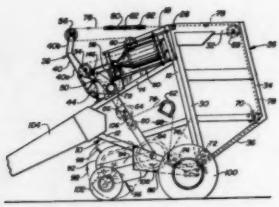
**BALING MACHINE WITH AIR SPRING MEANS FOR MAINTAINING APRON TENSION**

**Willis R. Campbell, Ephrata, and Edward T. Eggers, New Holland, both of Pa., assignors to Sperry Corporation, New Holland, Pa.**

**Filed Dec. 21, 1981, Ser. No. 333,205**

**Int. Cl.³ B30B *5/06***

**U.S. Cl. 100—88** **3 Claims**



1. In a roll baling machine having a frame, apron means supported on said frame defining an expandable bale chamber, said apron means moving from one position to another position during formation of a roll bale in said expandable bale chamber, the improvement comprising:

(a) an arm assembly rotatably mounted on said frame for supporting said apron means, said arm assembly rotating from a first position to a second position as said apron means goes from said one position to said another position during formation of a roll bale;

(b) air spring means connected to said arm assembly normally urging said arm assembly toward said first position in order to dispose a portion of said apron means which is located outside said expandable bale chamber in a substantially S-shaped configuration in side elevation, said air spring means including an air bag for containing air under pressure and a piston movable into said air bag; and

(c) the rotating movement of said arm assembly from said first position to said second position causing said piston to be moved into said air bag to increase the air pressure therein acting on said piston.

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**4,422,375**

**ROLLER PRESS**

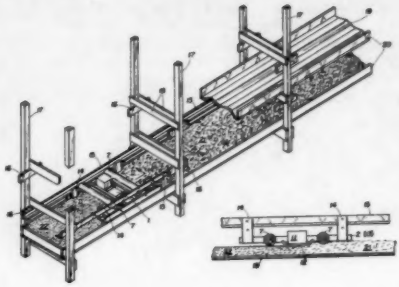
**Luigi Morganti, 3224 Harrison Ave., Reading, Pa. 19605**

**Filed May 6, 1982, Ser. No. 375,353**

**Int. Cl.³ B30B *3/02***

**U.S. Cl. 100—210** **2 Claims**

1. A roller press assembly for compacting mushroom beds, comprising a roller press including a pair of parallel frames, extending horizontally, a pair of rollers mounted on said frames at right angles to form a carriage, a central frame located between said rollers and supported by said parallel frames, a vertically adjustable smoothing plate mounted on said central frame substantially coextensive with said rollers and depending from said central frame, drive motor means including speed reducing means controlled by a reversing switch and mounted on said central frame for driving said rollers, successively, in one direction and in an opposite direction at reduced speed, a bunk bed comprising a plurality of



horizontally extending guide rails mounted on vertical posts in vertically spaced relationship, a mushroom bed mounted underneath each of said guide rails so as to enable said roller press to be successively moved to different tiers of said bunk bed and guided by said guide rails while traversing and compacting the associated mushroom bed.

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**4,422,376**

**PRINTING CONTROL APPARATUS FOR A LABEL PRINTER**

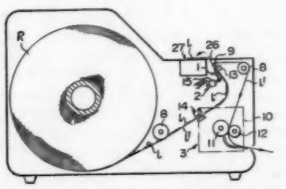
**Kazuharu Teraoka, Tokyo, Japan, assignor to Teraoka Seikosho Co., Ltd., Tokyo, Japan**

**Filed Jan. 30, 1981, Ser. No. 230,004**

**Claims priority, application Japan, Feb. 16, 1980, 55-19016[U]; Jul. 18, 1980, 55-98882; Jul. 22, 1980, 55-103394[U]; Sep. 2, 1980, 55-15104**

**Int. Cl.³ B41J *1/20***

**U.S. Cl. 101—69** **26 Claims**



1. Printing control apparatus used in conjunction with a thermal label printer, said printer comprising a thermal head having a plurality of transversely disposed thermal elements, said head adapted to be placed into contact with a printable surface of a thermosensitive color label and said thermal elements adapted to be energized in accordance with printing information received, at least one of said head and label adapted to be moved parallel to said printing surface and perpendicularly to said transversely disposed thermal elements for printing predetermined indicia on said label, said print control apparatus including means for selectively preventing said thermal head from being placed into an operative printing condition, wherein said means for selectively preventing said thermal head from being placed into an operative condition comprise a thermal head drive circuit and control means for selectively activating and deactivating said drive circuit when said control means detects any abnormal contact between said thermal head and said label.

4,422,377

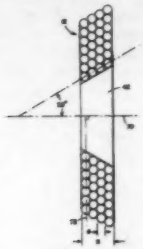
## PRINT HAMMER AND COIL ASSEMBLY

Val K. Jezbera, Thousand Oaks, Calif., assignor to Dataproducts Corporation, Woodland Hills, Calif.

Continuation of Ser. No. 23,739, Mar. 26, 1979, abandoned. This application Jan. 9, 1981, Ser. No. 223,937

Int. Cl.³ B41J 9/38

U.S. Cl. 101—93.29 7 Claims



7. A print hammer for use in high speed printers or the like, said print hammer including:

a flat sided elongated multilayered coil characterized when viewed in a plane including the central axis of the coil in that each layer of the coil contains the same number of turns, the number of layers of turns exceeds the number of turns in each layer, the wire is packed in a hex fashion, the axis of each wire at one end of every layer lies in a line parallel to a first side of the coil, and the axis of each wire at the other end of every layer lies in another line parallel to the other side of the coil and parallel to the first side of the coil, wherein the number of turns in each layer of the coil is less than ten;

a honeycomb matrix of adhesive in which the wires of the coil are embedded; and

a pair of metal plates, one adjacent to each side of the coil and attached to the adhesive matrix, wherein at least one of the metal plates includes a centering boss embossed on one side thereof for positioning the coil with respect to the plates.

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4,422,378

## MEANS FOR AND A METHOD OF INITIATING EXPLOSIONS

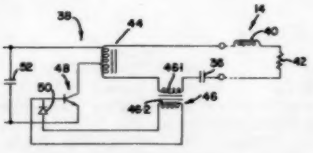
Bohumil M. J. Plichta, Kempton Park, South Africa, assignor to Imperial Chemical Industries PLC, London, United Kingdom

Filed Dec. 14, 1981, Ser. No. 330,584

Claims priority, application South Africa, Dec. 11, 1980, 80/7774

Int. Cl.³ F42C 11/00

U.S. Cl. 102—206 9 Claims




1. A means for initiating explosions which includes

a power oscillator means for generating an oscillating electric initiating signal of sufficient power at a variable frequency and having a current controllable element;

an output connecting means for connection to a primary wire of an A.C. operable detonating system for supplying the initiating signal thereto; and

a frequency setting means to which the oscillator means is responsive whereby, in use, when the power oscillator means is connected to a load it automatically generates a signal at the resonant frquency of the load, the frequency setting means including a positive feedback link for supplying to the controllable element a feedback current control signal.

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4,422,379

## MEANS FOR AND A METHOD OF INITIATING EXPLOSIONS

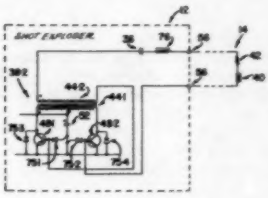
John M. E. Geller, Loans, and John P. Wilson, Kilwinning, both of Scotland, assignors to Imperial Chemical Industries PLC, Millbank, England

Filed Dec. 15, 1981, Ser. No. 331,081

Claims priority, application United Kingdom, Jun. 22, 1981, 8119236

Int. Cl.³ F42C 11/00; F42D 1/00

U.S. Cl. 102—206 14 Claims




1. A means for initiating explosions which includes

a power oscillator means for generating an oscillating electric initiating signal of sufficient power at a variable frequency;

a frequency setting means to which the oscillator means is responsive whereby, in use, when the power oscillator means is connected to a load it automatically generates a signal at the resonant frequency of the load.

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4,422,380

Patent Not Issued For This Number

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4,422,381

## IGNITER WITH STATIC DISCHARGE ELEMENT AND FERRITE SLEEVE

Joseph A. Barrett, Collegeville, Pa., assignor to ICI Americas Inc., Wilmington, Del.

Filed Nov. 20, 1979, Ser. No. 96,080

Int. Cl.³ F42B 3/10

U.S. Cl. 102—202.2 9 Claims

1. An electroexplosive device comprising:

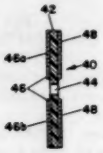
(a) an electrically conductive casing having an opening therein;

(b) a heat ignitable charge in said casing;

(c) means for igniting said charge including a bridge element in proximity with said charge and conductor means comprising at least one lead for supplying an electric current to said bridge element;

(d) a static discharge element for preventing accidental electrostatic discharge of said device, said element com-

prising a nonconductive substrate having an opening therein to permit said conductor means to extend therethrough, a thin electrically conductive layer covering a portion of at least one face of said substrate, said conductive layer being in electrical contact with said casing but out of contact with said opening means and said conductor means, said conductive layer have a boundary, a portion of which is disposed in proximity with but entirely




out of contact with the adjacent edge of said opening, whereby a spark gap is provided between said lead wires and said conductive member; and

(e) a ferrite sleeve having opening means extending longitudinally therethrough to permit said conductor means to extend therethrough, means for insulating the sleeve from said conductor means, and means for providing electrical contact between the sleeve and the casing.

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**4,422,382**

**EXPLOSIVE CONTAINER OF INTERCONNECTED THERMOPLASTIC FILM PACKAGES**

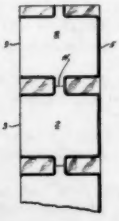
**Horst F. Marz, Otterburn Park, Canada, assignor to C-I-L Inc., North York, Canada**

**Filed Oct. 8, 1980, Ser. No. 195,344**

**Claims priority, application Canada, Oct. 24, 1979, 338324**

**Int. Cl.³ F42B *3/02***

**U.S. Cl. 102—331** **1 Claim**



1. Blasting explosive packages in the form of a train of integrally connected individual containers, joined together in alignment by narrow neck-like tubular film channels and adapted for continuous and automatic filling with flowable explosive mixtures, the said individual containers comprising superimposed front and back rectangular panels of thermoplastic film edge-sealed around the panel periphery to form sealed compartments having top and bottom ends and opposed side edges, each of the said top and bottom ends of each compartment having a narrow, extended, neck-like, tubular thermoplastic film aperture near its mid point and integral with the said panels, the said neck-like tube providing a connecting channel between compartments from the top edge of one compartment to the bottom edge of an adjacent compartment, the said train of containers thus describing a continuous line of individual containers having narrow neck-like, connecting conduits therebetween.

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**4,422,383**

**PERIPHERAL BURNING INCENDIARY DEVICE**

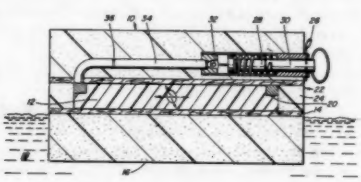
**Joseph E. G. Couture, St-Augustin, and Philip A. Twardawa, Shannon, both of Calif., assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada**

**Filed Oct. 14, 1981, Ser. No. 284,819**

**Claims priority, application Canada, Dec. 2, 1980, 365909**

**Int. Cl.³ F42B *25/14, 27/04***

**U.S. Cl. 102—364** **12 Claims**



1. A floating incendiary device for igniting a combustible material on the surface of a body of water, comprising

an incendiary composition;

flotation means for maintaining the incendiary composition above the surface of the water;

firing means for igniting the incendiary composition peripherally so that the incendiary composition burns inwardly; and

directing means for directing the resulting flame radially outwardly over the surface of the combustible material during the burn time of the incendiary composition.

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**4,422,384**

**ALL POSITION TRACTOR**

**David E. Johnson, Pataskala; Kenneth E. McCall, and William J. Coughlin, both of Lancaster, all of Ohio, assignors to Arcair Company, Lancaster, Ohio**

**Filed Jun. 16, 1981, Ser. No. 274,091**

**Int. Cl.³ B23Q *9/00*; B23K *7/10***

**U.S. Cl. 105—29 R** **5 Claims**

1. A tractor adapted for mounting on an elongated track fixed to a workpiece so that said tractor can carry a metal working tool along a fixed path defined by said track, comprising in combination:

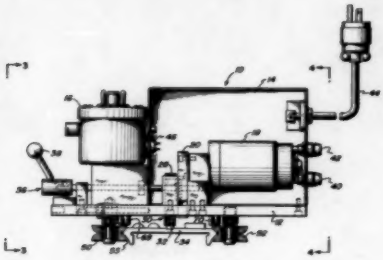
a base plate having four sides generally perpendicular to each other, said base plate adapted to have a low center of

gravity and to position associated drive means and accessory equipment along the center line of said track;

drive means mounted on said base plate and adapted to mate with means on said track to propel said tractor along said track;

depending from said base plate a first pair of wheels mounted for rotation about an axis perpendicular to said base plate, said axes generally parallel to one side of said base plate, said first pair of wheels adapted to support said tractor on said track by frictionally engaging one side of said track;

a third wheel depending from said base plate and mounted for rotation about an axis perpendicular to said base plate, said wheel being in a plane defined by said first pair of wheels and said third wheel said plane generally parallel



to but spaced below said base plate, said third wheel positioned so that the axes of rotation of said wheels in said plane define a triangle with the axis of said third wheel being at the apex of said triangle, said third wheel further adapted to be moved in a direction generally perpendicular to a line extending between and perpendicular to the axes of rotation of said pair of wheels; whereby said third wheel can be moved laterally from said pair of wheels to permit ready mounting of said tractor to said track; and

a plurality of rests buttons depending from said base plate said rest buttons adapted to aid positioning of said tractor to said track without contacting said track during operation of said tractor.

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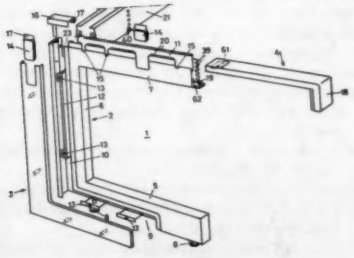
**4,422,385**

## OFFICE FURNITURE

**Wendolin Rutsche, Ruti, and Urs Langenegger, Hittnau, both of Switzerland, assignors to Embru-Werke, Mantel & Cie., Ruti, Switzerland**

**Filed Nov. 28, 1980, Ser. No. 211,031**
**Int. Cl.³ A47B *3/06***
**U.S. Cl. 108—153** **10 Claims**



**1.** Furniture in a modular design for setup at the work place, such that the modular unit has at least two generally U-shaped side parts connected by a transverse connecting beam, and each side part consists of a hollow upright column support with a projecting arm support and a projecting foot piece, characterized by the fact that at least the column support (**6**), the arm support (**7**) and the connecting beam (**21**) form a closable cable-carrying channel which allows uninterrupted access from the outside, and part of the channel in the arm support (**7**) is shaped in the form of a longitudinal slit (**11**) that is open at the top and is covered by a separate, displaceable covering strip (**4**) which is slidably inserted from the front inwardly toward the connecting beam, that the channel also runs through the foot piece, and wherein a vertical recess (**10**) in the column support (**6**) and a horizontal recess (**9**) in the foot piece (**5**) are closed by a displaceable L-shaped side cover (**3**).

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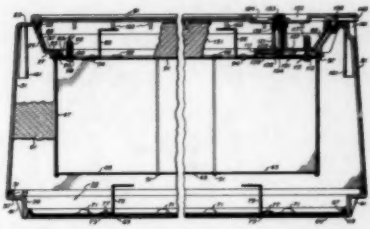
**4,422,386**

## SAFE AND METHOD OF MAKING THE SAME

**Britt C. Carpenter, Penfield, N.Y., assignor to John D. Brush & Co., Inc., Rochester, N.Y.**

**Filed Mar. 23, 1981, Ser. No. 246,864**
**Int. Cl.³ E05G *1/026***
**U.S. Cl. 109—59 R** **9 Claims**



**9.** The method of assembling a safe which comprises the steps of providing a hollow structure to receive a heat-resistive filling, pouring a quantity of such filling into the structure, discontinuing the pouring of filling when the space within the structure is less than completely full, so as to avoid spillage over the upper edges of the structure, and applying to the structure, over the filling, a covering member having an area which is mainly out of contact with the filling, the covering member having certain portions inwardly from the edges thereof which extend into firm contact with the filling.

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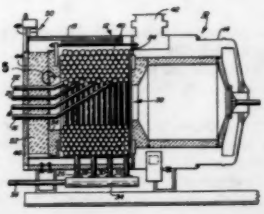
**4,422,387**

## DOOR SEAL

**Robert T. Brady, Elmhurst, and James G. Guyon, Chicago, both of Ill., assignors to Vapor Corporation, Chicago, Ill.**

**Filed Sep. 8, 1981, Ser. No. 300,242**
**Int. Cl.³ F23M *7/00***
**U.S. Cl. 110—173 R** **3 Claims**



**1.** A kit including component parts capable of being assembled in the field for sealing the interior surface of a door of a combustion chamber of a steam generator to protect said sur-

face from deterioration due to impingement of combustion products, the kit comprising:

a gasket pad adapted to be fitted over said surface and configured to include portions that extend beyond said surface, and

adhesive material for placement on said gasket pad and said surface for securing said pad to said surface, and

tape for securing said portions of said gasket pad to said door beyond said surface to hold said pad on said surface until said adhesive was set.

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**4,422,388**

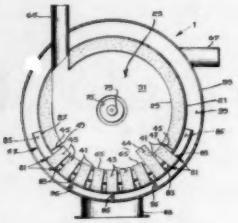
**WOOD AND OTHER SOLID REGISTER BURNER**

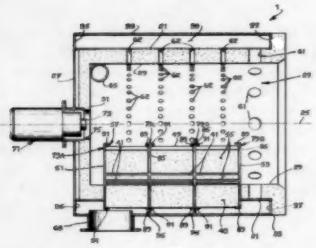
**Jean F. Raskin, 2255 Laird Blvd., Ville Mont-Royal, Quebec, Canada H3P 2V7**

**Filed Dec. 1, 1981, Ser. No. 326,050**

**Int. Cl.³ F23C *1/10***

**U.S. Cl. 110—261** **3 Claims**





1. A burner having:

a burning chamber defined by a substantially cylindrical wall provided with a heat resistant inner lining, the longitudinal axis of said chamber being generally horizontal,

an outer wall encircling the wall to form an annular distributing chamber about the burning chamber,

means for closing one end of the substantially cylindrical wall,

means adjacent said one end for introducing a material to be burnt, tangentially into the chamber,

means at said one end to ignite the material to have it burn as it moves spirally through the chamber away from the one end,

means for supplying air under pressure through said distributing chamber into the burning chamber to support the combustion,

a set of air inlets provided in the bottom portion of the burning chamber and connected to the air supplying means both to support combustion of the material to be burnt in the burning chamber and to fluidize the material being burnt with the pressurized air supplied,

said air inlets comprising a plurality of narrow slots arranged in longitudinal columns and circumferential rows to provide a regular array extending over most of the length of the chamber in the bottom third thereof,

said slots being formed by gaps left between a regular array of firebricks mounted in spaced apart relationship in an opening formed in both the walls of the chamber and the inner lining,

said regular array of firebricks being arranged in longitudinal columns and circumferential rows, supported in the opening by a grid, so that the inner surfaces of said firebricks are generally flush with the inner surface of the chamber lining, one longitudinal column of firebrick supported by the grid being higher than the others and extending inwardly into the burning chamber to disturb at least partially the spiral movement of the material being burnt.

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**4,422,389**

**SOLID-FUEL BURNER**

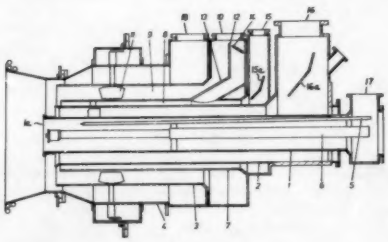
**Ulrich Schröder, Krefeld, Fed. Rep. of Germany, assignor to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany**

**Filed Jun. 25, 1982, Ser. No. 392,354**

**Claims priority, application Fed. Rep. of Germany, Jul. 1, 1981, 3125901**

**Int. Cl.³ F23M *7/08***

**U.S. Cl. 110—264** **11 Claims**



1. In a burner for the combustion of solid fuel in pulverulent form and having a first conduit for primary combustion-supporting fluid, the first conduit being spacedly surrounded by a second conduit for the pulverulent solid fuel, and a third conduit for secondary combustion-supporting fluid spacedly surrounding the second conduit, a combination comprising

an intermediate conduit between said second and third conduits and subdividing the space therebetween into two annular channels;

first means for admitting combustion-supporting fluid into one of said channels;

second means for selectively admitting combustion-supporting fluid, or a mixture of such fluid with pulverulent solid fuel, into the other of said channels;

a main inlet pipe communicating with said third conduit for admitting combustion-supporting fluid thereto; an auxiliary inlet pipe communicating with said other channel; and means for selectively blocking and unblocking the flow of combustion-supporting fluid through said auxiliary pipe into said other channel.

4,422,390

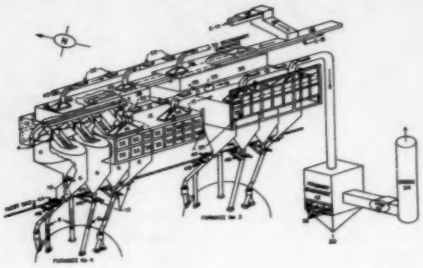
## PROCESS AND APPARATUS FOR COLLECTION OF GASES AND PARTICULATES IN A FURNACE FEED SYSTEM

Arthur J. Henriksen, Pocatello, Id.; Klaus F. Thiel, Foster City, Calif., and Carl F. Peterson, Pocatello, Id., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 169,248, Jul. 16, 1980, Pat. No. 4,368,676. This application Feb. 8, 1982, Ser. No. 346,826

Int. Cl.³ F23B 7/00

U.S. Cl. 110—341 3 Claims



1. A process for feeding a furnace with furnace feed and collecting the dust created by the feeding process which comprises positioning a reversible shuttle conveyor over feed bin chutes, feeding material from said conveyor into said feed bin chutes in sequential order until a feed bin sensor in each feed bin indicates the feed bin is full and forwards said conveyor to the next feed bin chute requiring filling, passing the feed material into feed bins located below the feed bin chutes until they are full, collecting the dust formed about the feed bin chutes and feed bins in an enclosure surrounding the feed bin chutes and feed bins, conveying the dust and gases within said enclosure through exhaust openings in the enclosure to a duct, heating the duct and the dust and gases therein sufficiently to maintain the dust and gases at above the dew point, conveying the gas stream to a separator, separating the dust from the gases, and discharging the gases from the separator.

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4,422,391

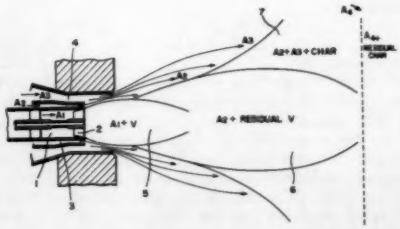
## METHOD OF COMBUSTION OF PULVERIZED COAL BY PULVERIZED COAL BURNER

Akira Izuha, Koganei; Tomoyuki Shinano, Yokohama; Yuho Shibayama, Warabi; Chikatoshi Kursta, Akashi, and Kenichi Fujii, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Mar. 12, 1981, Ser. No. 242,950

Int. Cl.³ F23D 1/00

U.S. Cl. 110—347 2 Claims




1. A method of combustion of pulverized coal by a pulverized coal burner, comprising the steps of:

combusting the pulverized coal by supplying thereto air for combustion mixed with exhaust gas in a proportion of 35–60% of the air necessary for carrying out combustion in a first stage of combustion; and

supplying to a flame formed in the first stage of combustion air for combustion in a proportion of 25–35% of the air necessary for carrying out combustion.

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4,422,392

## SEED DRILL WITH DISK-TYPE FURROW OPENERS

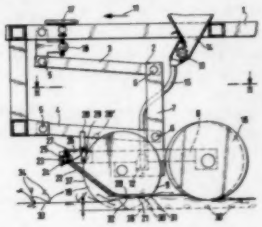
Heinz Dreyer, Hasbergen-Gaste, and Benno Wiemeyer, Osnabrück-Pye, both of Fed. Rep. of Germany, assignors to Amazonen Werke AG H. Dreyer, Hasbergen-Gaste, Fed. Rep. of Germany

Continuation of Ser. No. 170,215, Jul. 18, 1980, abandoned. This application May 26, 1982, Ser. No. 382,340

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1979, 2929622; Feb. 8, 1980, 3004587

Int. Cl.³ A01C 5/00

U.S. Cl. 111—52 7 Claims



1. In a seed drill having a frame, furrow opener disks rotatably mounted at an acute angle with respect to the direction of travel on supports which are movable vertically with respect to the frame, a seed outlet disposed at the inside soil nonworking surface of each disk, a skid for each disk and means mounting a skid to each support at the outside soil working surface of the disk and at an angle with respect to the direction of travel, the improvement wherein: each skid comprises a trailing portion configured to have a slidably engagable surface disposed above the depth of penetration of the disk in the ground, a leading portion bent upwardly in the direction of travel and having a recess defined in the side thereof facing the disk, the recess extending beyond the forwardmost portion of the disk in the direction of travel and the means mounting each skid comprises means releasably connecting the leading portion of the skid to the support for the pivotal movement of the trailing portion of the skid towards and away from the ground, spring means for biasing the trailing portion of the skid towards the ground and adjustable stop means to limit the pivotal movement of the trailing portion of the skid towards the ground whereby soil acted upon by the disk will be substantially prevented from being turned over but will be returned to the furrow formed by the disk in substantially the same profile as before the furrow was formed.

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4,422,393

## SEWING MACHINE HAVING AUTOMATIC PALLET HANDLING

Herbert Johnson; Richard M. Elliott, both of Beverly; Donald F. Herdeg, So. Hamilton, and Alan M. Peck, Beverly, all of Mass., assignors to USM Corporation, Farmington, Conn.

Filed May 22, 1981, Ser. No. 266,144

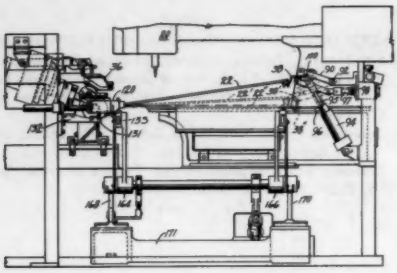
Int. Cl.³ D05C 9/04

U.S. Cl. 112—121.15 87 Claims

1. In an automatic sewing machine system, apparatus for automatically processing a plurality of workpieces prearranged within pallets, said apparatus comprising:

means for receiving a prearranged workpiece within a pallet;

means, located below said receiving means, for automatically attaching a pallet transmitted from said receiving means to a means for automatically positioning the prearranged workpiece relative to a sewing needle so as to produce a sewn workpiece;



means located below said automatic positioning means, for automatically ejecting the pallet containing the sewn workpiece; and

means for automatically controlling said receiving means, said automatic attaching means, and said automatic ejecting means so as to process received pallets.

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4,422,394

## SEWING GUIDE OF A SEAM PATTERN SEWING MACHINE

Bengt A. Bergvall, Huskvarna, Sweden, assignor to Husqvarna Aktiebolag, Huskvarna, Sweden

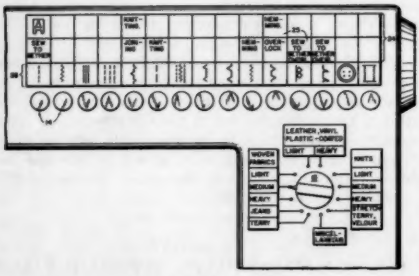
PCT No. PCT/SE81/00090, § 371 Date Nov. 19, 1981, § 102(e) Date Nov. 19, 1981, PCT Pub. No. WO81/02751, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 19, 1981, Ser. No. 325,429

Claims priority, application Sweden, Mar. 19, 1980, 8021397

Int. Cl.[3] D05B *3/02*

U.S. Cl. 112—158 F 8 Claims



1. In a seam pattern sewing machine having a seam pattern selector including a plurality of switch means and means responsive to the operation of the switch means for selectively creating seam selection codes, and separate indicator means associated with each of said switch means; the improvement comprising a second selector having positions corresponding to characteristics of a material to be sewn, and encoding means coupled to said second selector for energizing selected ones of said indicators at each position of said second selector, for indicating the seams that may be sewn on the chosen material.

4,422,395

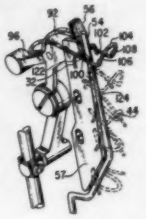
## THREAD HANDLING ARRANGEMENT WITH FIBER CARRYING STRIP AND CAM

Donald Rodda, Butler, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Mar. 12, 1982, Ser. No. 357,446

Int. Cl.[3] D05B *49/00*

U.S. Cl. 112—254 7 Claims



1. In a sewing machine wherein a sewing needle and looptaker cooperate in the formation of lockstitches in a fabric, the combination comprising: a thread source, thread tensioning means to which thread extends from the thread source; a thread handling device into which thread extends from the tensioning device and beyond which the thread extends to the needle, the thread handling device including an elongate rigid member and a fiber supporting strip from which resilient fibers project outwardly into contact with said rigid member and the thread in the thread handling member; a takeup for setting stitches and pulling thread through the tensioning device from the supply, the takeup being movable in one direction with thread to a stitch setting position at one end of its operating range whereat the thread is disposed for temporary retention by said thread handling device, and movable in the opposite direction free of the thread to the other end of said operating range to enable thread to move in the thread handling device away from the temporary retention position to a position of reengagement with the takeup at said other end of its operating range and during such movement shorten the path for thread between the tensioning device and needle to supply a quantity of thread for use by the needle and looptaker; and a cam in the thread path between the thread handling device and needle, said cam being located with respect to the thread handling device to engage thread exiting from the thread handling device, the cam including a gentle slope at the extreme upper end of an effective edge of the cam on which descent of the thread from its temporary retention position is delayed.

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4,422,396

## BELT RETAINER GUARD FOR SEWING MACHINE

Jan Szostak, Lincroft, N.J., assignor to The Singer Company, Stamford, Conn.

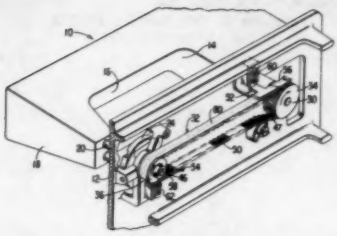
Filed Jul. 14, 1982, Ser. No. 398,025

Int. Cl.[3] D05B *83/00*

U.S. Cl. 112—261 3 Claims

1. In a sewing machine, a toothed driving pulley, a toothed driven pulley, a toothed timing belt extending over and in toothed engagement with both said pulleys for imparting rotation to the driven pulley when the driving pulley is rotated, a belt guard for each pulley, each belt guard being located for a predetermined direction of rotation of the driving pulley on the belt entering side only of the pulley with which the belt is associated and being disposed closely adjacent to the outside surface of the belt where the belt enters the pulley to thereby guide the belt onto the pulley and prevent teeth on the belt from jumping over teeth on the pulley, and inwardly acting belt deflecting means in engagement with a length of the timing belt extending between the unguarded belt exiting side of one pulley and guarded thread entering side of the other pul-

ley, said length of timing belt being engaged by the belt deflecting means at a location therealong which is closer to the un-



guarded belt exiting side of the said one pulley then to the guarded thread entering side of the said other pulley.

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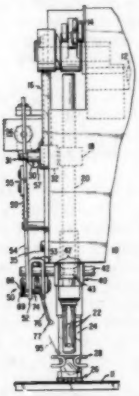
**4,422,397**

## NEEDLE THREAD WIPING DEVICE

**Reinhold Papajewski, Stutensee-Friedrichsthal, and Lothar Reinfurth, Karlsruhe, both of Fed. Rep. of Germany, assignors to The Singer Company, Stamford, Conn.**

**Filed Sep. 3, 1981, Ser. No. 299,243**
**Int. Cl.³ D05B *65/06***
**U.S. Cl. 112—286** **1 Claim**



1. A needle thread wiping device adapted for use on a sewing machine having a frame, said frame including a work supporting bed having at least one orifice therein, at least one thread carrying needle supported by said frame for reciprocation in an endwise path through said at least one orifice, and a thread trimming mechanism associated with said sewing machine for severing sewing thread, said thread wiping device comprising in combination:

a. a mounting bracket;

b. means for supporting said mounting bracket on said sewing machine frame adjacent said endwise path of reciprocation of said thread carrying needle;

c. a first and second substantially parallel shafts supported in said mounting bracket;

d. a lever carried by said first shaft, a first sleeve pivotably carried by one end of said lever;

e. means for selectively actuating said lever to rotate the same relative to said mounting bracket when said thread carrying needle is reciprocated upwardly;

f. a link having one end carried by said second shaft, a second sleeve pivotably carried in the other end of said link;

g. a thread wiper having a hook on one end thereof;

h. means for slidably supporting said thread wiper in said first and second sleeves;

i. means for constraining three dimensional motion of said thread wiper on actuation of said actuating means, said constraining means further comprising a back plate having a curved slot with said second shaft extending therethrough and a pivotal connection between said back plate and said first sleeve, whereby said hook end of said thread wiper is influenced upon actuation of said actuating means to move substantially in a first plane at a shallow angle to said needle from an initial position outside of said endwise path of reciprocation of said thread carrying needle to a position substantially in said path immediately adjacent said orifice and later return to said initial position from said position substantially in said path upon deactuation of said actuating means, and a lug carried by said thread wiper having a portion thereof pivotally connected to said back plate whereby said hook end of said thead wiper is influenced by the latter part of said actuation of said actuating means to implement a motion in said hook end in a second plane substantially normal to said first plane from substantially in said path immediately adjacent said orifice transversely across said path of said at least one needle, and an immediate return therefrom upon deactuation of said actuating means.

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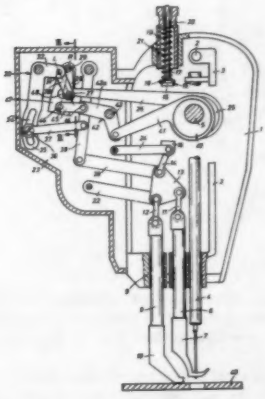
**4,422,398**

## TOP FEED DEVICE FOR A SEWING MACHINE

**Albert Dusch, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany**

**Filed May 29, 1981, Ser. No. 268,154**
**Claims priority, application European Pat. Off., Aug. 22, 1980, 80105004.8**
**Int. Cl.³ D05B *27/04***
**U.S. Cl. 112—320** **5 Claims**



1. A transport device for a sewing machine having a housing, a feeder foot (7) and a fabric presser foot (10), drive means (5) for driving the feeder foot and the presser foot, transmission means operatively interconnecting the presser foot (10) and the feeder foot (7) to the drive means (5) for alternately reciprocating the feeder foot and the presser foot relative to each other in up and down motions directed perpendicular to a stitch plate (49) of the sewing machine, such that the speed of the up and down motions approach zero during a touchdown phase of the feeder foot and presser foot, the transmission means being of the type having an eccentric (25) connected to the drive means for oscillating in a selected frequency, a triangular lever (13) interconnecting the feeder foot and the presser foot, a coupling member (33) connected to the eccentric, and a linkage system

(37,38,39) having a link pivotally connected to the housing and interconnecting the coupling member (33) to the triangular lever (13), the improvement wherein the transmission means comprises a steering arm transmission (28,30) having a variable transmission ratio between an input (27) thereof and an output (31) thereof, said steering arm transmission interconnected between the eccentric (25) and the coupling member (33) and oscillating at the selected frequency of the eccentric, the improvement further comprising a linkage transmission (40,41,42,45,47; 101, 140,141,47) connected to the drive means (5) and said steering arm transmission for varying the transmission ratio of said steering arm transmission, said linkage transmission connected to said drive means for operating at twice the selected frequency of the steering arm transmission and eccentric.

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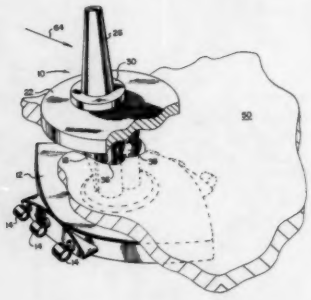
4,422,399

## MEANS FOR INCREASING THE EFFICIENCY OF AN ICE DISAGGREGATION SYSTEM

George W. Morgan, La Jolla, Calif., assignor to Suncor, Inc., Toronto, Canada

Filed Sep. 7, 1978, Ser. No. 940,245
Int. Cl.³ B63B *35/08*
U.S. Cl. 114—42 3 Claims



1. In an ice disaggregation system characterized by at least one rotating drum, which drum carries ice engaging teeth structure on the peripheral surface thereof, the improvement comprising:

(A) a plurality of tooth supporting brackets distributed about and affixed to the peripheral surface of the drum, each of said brackets including an elongated tooth carrying beam portion disposed generally parallel to the drum peripheral surface and rigidly supported outwardly therefrom by a plurality of bracket legs;

(B) a plurality of ice engaging teeth fixed to said bracket beam portion, each of said teeth having a sharp, ice engaging forward portion, said teeth being oriented such that the forward portions thereof generally face the direction of drum rotation; and

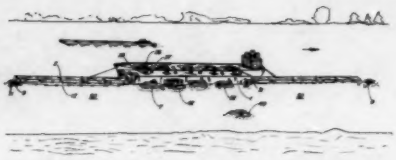
(C) each of said teeth being further oriented such that said forward portion is disposed at an acute angle with respect to the drum axis, the upper edge of said forward portion extending radially outwardly further from the drum surface than the lower edge thereof.

4,422,400

## MARINE SYSTEM FOR UNLOADING AND LOADING BULK PRODUCT

Peter G. Burke, New Orleans, La., assignor to Gibeshemael Incorporation, New Orleans, La.

Filed Jun. 8, 1981, Ser. No. 271,503
Int. Cl.³ B63B *25/06*
U.S. Cl. 114—73 19 Claims



1. A marine system for transferring bulk product loads from and/or into barges and the like, comprising in combination:

(a) a floating transfer vessel having load transfer means for transfering a load between said transfer vessel and at least one barge and having an entry end and an exit end and the load transfer area there between;

(b) entry barge handling means for moving barges to said transfer vessel, including

a separate, entry, anchored floating structure substantially removed out away from said transfer vessel;

an extended, moveable, closed, endless, entry line extending from the entry end of said transfer vessel to a spaced entry point on said separate, entry floating structure;

temporary barge connection means carried by said entry line for temporarily connecting said entry line to a barge; and

entry drive means associated with said entry line for causing said entry line and its barge connection means to move from said spaced entry point inwardly toward said entry end of said transfer vessel moving the barge to said transfer vessel; and

(c) exit barge handling means located at the opposite end of said transfer vessel from said entry means for moving barges away from said transfer vessel, including

a separate, exit, anchored floating structure substantially removed out away from said transfer vessel;

an extended, moveable, closed, endless, exit line extending from the exit end of said transfer vessel to a spaced exit point on said separate, exit flowing structure;

temporary barge connection means carried by said exit line for temporarily connecting said exit line to a barge; and

exit drive means associated with said exit line for causing said exit line and its barge connection means to move toward said spaced exit point outwardly away from said exit end of said transfer vessel moving the barge out away from said transfer vessel.

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4,422,401

## RAISED ANCHOR POINT CATENARY MOORING SYSTEM

George M. Pomonik, Van Nuys, Calif., assignor to Amtel, Inc., Providence, R.I.

Filed Jul. 14, 1980, Ser. No. 168,050
Int. Cl.³ B63B *21/24*
U.S. Cl. 114—294 2 Claims

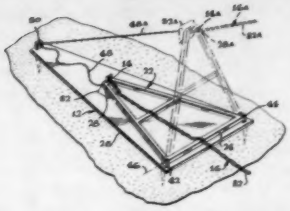
1. An offshore mooring system for use in a sea, comprising:

a member to be anchored having a portion substantially at the sea surface;

a plurality of chain devices extending in loose curves from said member portion to the sea bed;

a plurality of anchoring devices, each having a base mounted on the sea floor and a substantially rigid arm having an inner end pivotally mounted on the base about a largely

horizontal axis and an outer end connected to an end of one of said chain devices, said outer end of said arm lying on a side of said axis which is opposite said member; and



a limit line extending between locations on said base and said arm which are each spaced from the axis of pivoting of said arm on said base, to prevent pivoting of the arm by more than a limited angle from the horizontal.

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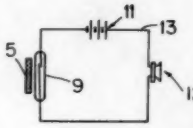
**4,422,402**

## APPARATUS FOR DETECTING THE REMAINING AMOUNT OF ROLLED PAPER

**Masato Ogihara, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Japan**

**Filed Feb. 20, 1981, Ser. No. 236,640**
**Claims priority, application Japan, Feb. 20, 1980, 55-21022[U]**
**Int. Cl.³ G08B 7/06, 21/00**
**U.S. Cl. 111—67 A** **9 Claims**




1. An apparatus for detecting the remaining amount of rolled paper, comprising:

a roll of paper, the diameter of which decreases as it is unrolled,

a swingable detection biased lever having a free end and a fixed end, the fixed end mounted on a support plate in said apparatus, said lever lying along the side of the roll of paper and said lever adapted to move in a plane parallel to the side of the roll of paper, and elongated contact means having a roller connected to said free end of said lever and urged into contact with the outer peripheral surface of said roll of paper,

a magnet piece attached to said free end of said detection lever,

at least one magnetism sensor mounted on a support plate in said apparatus and disposed at such a position that the sensor is activated by said magnet piece when said swingable detection lever with said magnet piece comes to a predetermined position relative to said sensor as the diameter of said rolled paper decreases to a predetermined diameter, and

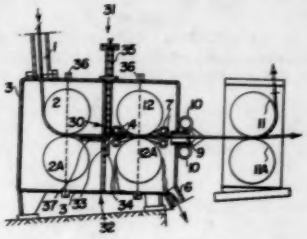
alarm indicating means activated in accordance with the activation of said magnetism sensor.

**4,422,403**

## DIPLESS METALLIZING APPARATUS

**Theodore Bestrom, 470 Park Rd. Ext., Middlebury, Conn. 06762**

**Division of Ser. No. 145,302, Apr. 30, 1980, Pat. No. 4,357,838. This application Apr. 7, 1982, Ser. No. 366,312**
**Int. Cl.³ B05C 11/00**
**U.S. Cl. 118—63** **11 Claims**




1. Apparatus for providing a metallic article with a metal coating, said apparatus comprising:

(a) a coating chamber having an entrance opening for the metallic article to be coated, and an exit opening for the metal coated article,

(b) means within and enclosed by said chamber for applying a continuous stream of molten metal to the metallic article to be coated for a very short period of time so as to uniformly and evenly distribute the coating metal over the surface of the hot metallic article so as to coat the same,

(c) means downstream of said molten metal applying means for subjecting the coated metallic article to a hot gas blast comprising steam or other gases which would otherwise oxidize any aluminum contained in the molten coating metal except for the rapidity of the coating step, so as to remove substantially completely excess coating metal from the coated article, and

(d) means exterior to the exit opening of said coating chamber for rapidly cooling the metal coated article, prior to further handling.

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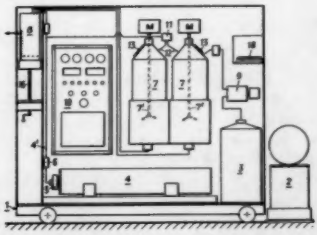
**4,422,404**

## APPARATUS FOR COATING OF GLASS

**Siegfried Harcuba, Innsbruck, Austria, assignor to Glasfabriken-Ausruestergesellschaft m.b.H., Innsbruck, Austria**

**Filed Jan. 18, 1982, Ser. No. 339,946**
**Claims priority, application Austria, Jan. 21, 1981, A 229/81**
**Int. Cl.³ B05B 1/14**
**U.S. Cl. 118—315** **20 Claims**



1. An apparatus for applying to a glass object a coating of metal chlorides which are dissolved in an organic acid, comprising a hood having an opening therein, said glass object being disposed in the region of said opening, at least one thermoshield supported in the region of said opening in said hood

and having means for heating said glass object, a nozzle bar movably supported within said hood, a plurality of nozzles supported on said nozzle bar, first means for dissolving said metal chlorides in said organic acid in an environment free of oxygen to produce a coating fluid, and second means for supplying said coating fluid to said nozzles on said nozzle bar free of exposure to oxygen, said coating fluid being sprayed onto said glass object by said nozzles.

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**4,422,405**

## COLOR ELECTROSTATOGRAPHIC APPARATUS

**Nobuo Kasahara; Tosio Nakahara, and Hidetoshi Yano, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Nov. 8, 1978, Ser. No. 958,872**
**Claims priority, application Japan, Nov. 25, 1977, 52-141173**
**Int. Cl.³ G03G *15/09, 15/00***
**U.S. Cl. 118—658** **9 Claims**

1. An electrostatographic apparatus including a rotary photoconductive member and a rotary magnetic brush developing means operatively disposed closely adjacent to the photoconductive member for applying toner thereto, characterized by comprising:

a plurality of applicator means which are fixed in position and selectively actuatable for applying toners of different respective colors to the developing means; and

actuator means for selectively actuating the applicator means;

each applicator means comprising container means for containing the toner and magnetic brush means for applying the toner from the container means to the developing means;

each applicator means comprising removal means disposed downstream of the photoconductive member and upstream of the magnetic brush means in a direction of rotation of the developing means for removing toner from the developing means;

each removal means being normally maintained inoperative and being actuated for operation by the actuator means together with the respective magnetic brush means.

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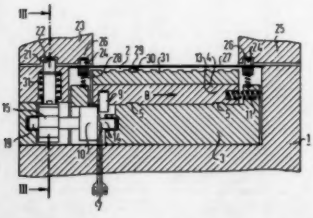
**4,422,406**

## APPARATUS FOR MANUFACTURING METAL LAYERS AND GLOW POLYMER LAYERS WHICH ARE SUPERIMPOSED AND ARRANGED LATERALLY OFFSET RELATIVE TO ONE ANOTHER

**Reinhard Behn, and Kurt Kaufman, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**PCT No. PCT/DE80/00115, § 371 Date Jul. 7, 1981, § 102(e) Date Jul. 7, 1981, PCT Pub. No. WO82/00542, PCT Pub. Date Feb. 18, 1982**
**PCT Filed Aug. 4, 1980, Ser. No. 279,998**
**Int. Cl.³ C23C *13/08***
**U.S. Cl. 118—719** **11 Claims**



1. In apparatus for manufacturing metal layers and glow polymer layers which are superposed on and arranged laterally offset of one another on a substrate, in which a rotatable cylinder and lock jaws form air locks between first and second vacuum chambers which respectively contain a glow polymer layer deposition structure and a metal layer deposition structure, in which a plurality of cavities are provided about the periphery of the cylinder for supporting respective substrates and carrying the same through the vacuum chambers, and in which each cavity has a displaceable apertured diaphragm at the surface of the cylinder, as a mask for the selective application of the glow polymer and metal layers, the improvement in combination therewith comprising:

for each cavity

a support in the cavity for supporting a substrate;

support mounting means in the cavity mounting said support for movement in a direction which includes a direction component which is parallel to the axis of rotation of the cylinder;

indexing means including an axially movable pin biased outwardly and mounted in and extending outwardly of the cylinder, and an indexing drive coupled between said pin and said support and operable to move said support on said support mounting means to a respective predetermined position upon each inward movement of said pin; and

for all of the cavities

pin control means mounted adjacent and stationary with respect to the cylinder and including camming means engaging the pin and defining and effecting inward and outward movements of said pin at predetermined rotational positions of the cylinder.

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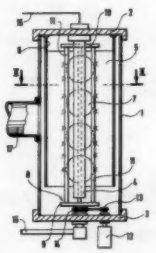
**4,422,407**

## APPARATUS FOR CHEMICALLY ACTIVATED DEPOSITION IN A PLASMA

**Jean-Jacques Bessot, Arpajon, and Bernard Bourdon, Gometz le Chatel, both of France, assignors to Compagnie Industrille des Telecommunications Cit-Alcatel, Paris, France**

**Filed Sep. 16, 1981, Ser. No. 302,936**
**Claims priority, application France, Sep. 17, 1980, 80 19983**
**Int. Cl.³ C23C *13/08***
**U.S. Cl. 118—723** **2 Claims**



1. An apparatus for chemically activated deposition in a plasma, said apparatus comprising: a chamber in which a vacuum is maintained, said chamber having a longitudinal axis of symmetry and being closed by means of first and second removable end plates; a substrate support disposed about said axis within said chamber; a reactive gas distribution manifold; and means for setting up and maintaining a plasma inside said chamber, the improvement wherein; said substrate support is of polygonal cross-section, constituted by rectangular longitudinally extending facets, and wherein said manifold comprises two circular end portions interconnected by longitudinally extending pipes, means for rotating said manifold at uniform speed about the axis of the chamber and inside said substrate support, and wherein said pipes are provided with gas outlet orifices on the sides remote from the axis of rotation and facing said substrates borne by said longitudinally extending facets.

4,422,408

## SHIELDING DEVICE FOR THE TEMPERATURE AND POLLUTION CONTROL OF WATER IN A FARMING ENCLOSURE FOR FISH AND OTHER AQUATIC ORGANISMS

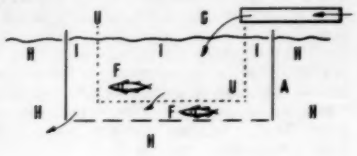
Henn Pohlhausen, Friedrichstr. 56, D-2110 Buchholz in der Nordheide, Fed. Rep. of Germany

Filed Feb. 10, 1981, Ser. No. 233,098

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1980, 3005150

Int. Cl.³ A01K *63/00*

U.S. Cl. 119—3 10 Claims




10. A fish farming device comprising a warm water shield enclosure for forming a warmer epilimnion in a surrounding body of cooler water comprising a peripherally closed water impermeable vertical single wall structure extending above the surface of said surrounding body of water and sufficiently below said surface to enclose the warmer water having lower unit weight than the surrounding water and provided with an anchoring means to maintain said enclosure in a relatively static position, said wall defining an enclosure open only to the atmosphere at its top and open to said body of surrounding water only at its bottom and laterally completely closed with respect to said surrounding body of water along its sides and at its top whereby the warmer water having a lower unit weight is enclosed within said shield and is prevented from flowing off laterally, and means for supplying water warmer than said surrounding body of water to the interior of said enclosure thereby maintaining an artificial warmer epilimnion within said enclosure.

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4,422,409

## AUTOMATIC ANIMAL FEEDING APPARATUS

Ralph Walker, 6340 Glenhills Way, Sacramento, Calif. 95824, and David Bories, Fair Oaks, Calif., assignors to Ralph T. Walker, Sacramento, Calif.

Filed Dec. 14, 1981, Ser. No. 330,444

Int. Cl.³ A01K *5/02*

U.S. Cl. 119—51.11 10 Claims

1. Apparatus for providing food and water to an animal comprising:

a housing;

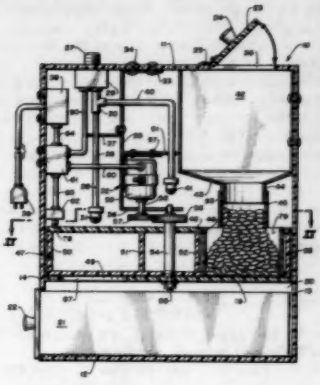
a partition wall dividing the interior of the housing into an upper water and food chamber and a lower enclosed accessible waste chamber;

a rotatable carousel having spaced top and bottom walls disposed above said partition separating the upper and lower chambers;

a water inlet opening into the interior of the upper chamber;

a food storage bin mounted in said upper chamber, said bin communicating at its lower end with an opening in said top wall of said carousel, said opening in said top wall of said carousel communicating with a food ring, adapted to receive food from said bin, disposed between the top and bottom walls of said carousel; and

an opening in said partition wall remote from said lower end of said bin communicating with the interior of said waste chamber whereby waste remaining in said food ring can move by gravity from said food ring to said waste chamber upon rotation of said carousel, said carousel having an animal feed position intermediate of said lower end of said



bin and said opening in said partition wall wherein food is exposed to said animal.

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4,422,410

## DOMESTIC COMBUSTION APPLIANCES

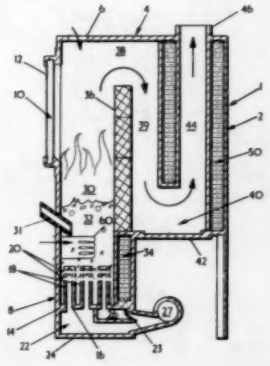
John M. Lake, Woodmancote, and Robert C. Payne, Bishop Cleeve Nr. Cheltenham, both of England, assignors to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 249,960, Apr. 1, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 431,198

Claims priority, application United Kingdom, Apr. 22, 1980, 8013281

Int. Cl.³ F22B *1/02, 31/04*

U.S. Cl. 122—4 D 2 Claims



1. A fluidized bed domestic combustion appliance comprising an upstanding body, an air permeable support horizontally within the body defining a plenum chamber below the support and a compartmented combustion zone above the support; said support having a plurality of apertures with standpipes located in the apertures and perforations in the standpipes leading toward said combustion zone;

said combustion zone having a fluidized bed of particulate material immediately above said support and standpipe, an electric heater centrally positioned and immersed in a front portion of said fluidized bed; a primary boiler located adjacent a rear portion of said fluidized bed;

means for introducing air into the combustion zone above the support;

flue passages downstream of the combustion zone comprising a generally vertical downwardly extending open passage connected to the top of the combustion zone, a particulate matter drop-out zone at the base of said vertical passage, a further flue opening outwardly therefrom, and a secondary boiler in one of the walls of said flue passages;

said plenum chamber having fan means for inducing an air flow through the air permeable support, closure means for blocking off air flow to said rear portion of the fluidized bed, means to simultaneously actuate the electric heater and to close the closure means so that during start-up when the electric heater is bringing the front portion of the fluidized bed up to operating temperature, the rear portion of the fluidized bed can be kept at a lower temperature to avoid heat loss to the primary boiler.

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**4,422,411**

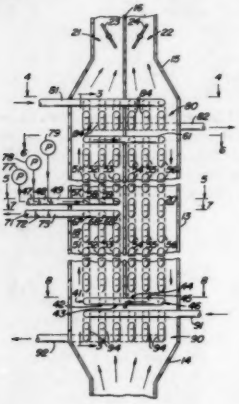
**CONVECTIVE HEATER**

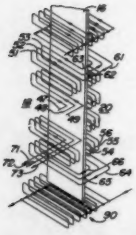
**Robert M. Thorogood, Macungie, Pa., assignor to International Coal Refining Company, Allentown, Pa.**

**Filed May 29, 1981, Ser. No. 268,450**

**Int. Cl.³ F22D *1/00***

**U.S. Cl. 122—7 R** **1 Claim**





1. A convective heater for heating fluids such as a slurry or the like comprising:

means defining a heating chamber having an inlet at one end and an outlet at its other end,

means dividing said chamber into two heating gas flow paths whereby heating gases passing from said inlet to said outlet are divided into two heating gas streams,

and conduit means for the flow of the fluid to be heated through said heating chamber in heat exchange relationship with the heating gases passing from said inlet to said outlet,

said conduit means comprises three parallel mixed flow tube circuits arranged to provide a mixed flow tube circuit in which the fluid to be heated enters one of said heating gas flow paths at a location between said inlet and outlet to flow in a co-current direction with said heating gases through said one path to a location near said outlet whereat said tube circuit transfers to said other heating gas path to then flow in a counter-current direction relative to said heating gas through said other path to a location near said inlet whereat said tube circuit transfers back to said one path to flow in a co-current direction to said entry location whereat said tube circuit leaves said one path,

wherein each of said tube circuits comprises tubes arranged in a serpentine-like arrangement comprising return bends located externally of said heating chamber, and passing back and forth transversely through said heating chamber as the fluid to be heated flows in said co-current and counter-current flow paths, and

wherein said tube circuits comprise three stacks of said transverse tubes extending along each of said heating gas flow paths and arranged in a generally parallel relation to one another to provide an inner tube stack, an intermediate tube stack and an outer tube stack, successive return bends for one of said tube circuits extending between the transverse tubes located in said outer and inner tube stacks in a pass, successive return bends for another of said tube circuits extending between the transverse tubes of said inner and intermediate tube stacks and successive return bends for the other of said tube circuits extending between the transverse tubes of said intermediate and outer tube stacks.

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**4,422,412**

**DEVICE FOR CONVERTING ALCOHOLS TO ETHERS**

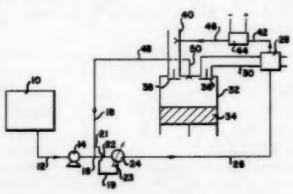
**John H. R. Norton, Johannesburg, South Africa, assignor to AECI Limited, Johannesburg, South Africa**

**Continuation of Ser. No. 214,794, Dec. 9, 1980, abandoned. This application Nov. 16, 1982, Ser. No. 442,001**

**Claims priority, application South Africa, Dec. 27, 1979, 79/7031**

**Int. Cl.³ F02M *27/02***

**U.S. Cl. 123—3** **2 Claims**



1. A compression ignition engine capable of running on a fuel of methanol and dimethyl ether, said engine comprising a compression ignition engine having at least one cylinder, a heat exchanger mounted by mounting means on the compression ignition engine, said heat exchanger being adapted to heat methanol passing therethrough to a temperature in the range of 80° to 400° C., a conversion chamber containing a catalyst for converting methanol to dimethyl ether at a temperature in the range of 80° to 400° C., also mounted by mounting means on the compression ignition engine, a supply tank for methanol, a first pipeline to lead a stream of methanol from the supply tank to the cylinder, a second pipeline to lead a stream of the methanol from the supply tank to the heat exchanger, a pipe for the methanol vapour leading from the heat exchanger to the con-

version chamber, and a pipe for the dimethyl ether leading from the conversion chamber to the cylinder.

2. A method of running a compression ignition engine on methanol and dimethyl ether, which comprises supplying a first part of methanol fuel from a supply tank containing the methanol fuel through a first pipe to a cylinder of the engine, and supplying a second part of the methanol from the supply tank through a second pipe to a heat exchanger where it is heated to a temperature in the range of 80° to 400° C., supplying this second part of the methanol at a temperature in this range from the heat exchanger to a catalytic conversion chamber containing a catalyst capable of converting the methanol to dimethyl ether at a temperature in the range of 80° to 400° C. and leading the dimethyl ether formed directly to the cylinder.

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**4,422,413**

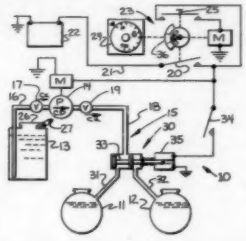
## APPARATUS FOR AND METHOD OF PRECISELY UPGRADING PUMP FUEL IN A MOTOR VEHICLE

**Jeffrey W. Pederson, Thief River Falls, Minn., assignor to Met-Con Manufacturing, Olathe, Kans.**

**Filed Aug. 10, 1981, Ser. No. 291,417**

**Int. Cl.³ F02B *47/00*; F02M *43/00*; F02D *19/00***

**U.S. Cl. 123—25 J** **22 Claims**



1. An on-board motor vehicle fuel treatment system for a motor vehicle having a primary fuel tank, comprising:

(a) a discrete reservoir for liquid fuel supplement;

(b) an electrically powerable pump for pumping liquid supplement at a constant volumetric amount per unit of time from said reservoir to said tank;

(c) a fuel supplement transfer line having a suction line fluidly connecting said reservoir to an inlet of said pump, and a delivery line connecting an outlet of said pump to said tank;

(d) a normally open pump control switch in a power lead between a source of electromotive power and said pump; and

(e) a timer operatively connected to said switch, said timer being operative to maintain said switch closed and to effect operation of said pump for a duration of time, said timer having

(1) an adjustable timer control having means for setting a duration of time based upon volumetric units of fuel, said control being adjustably settable on the basis of the volumetric units of untreated fuel in said tank, and

(2) means for initiating operation of said timer.

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**4,422,414**

## PISTON AND CYLINDER ARRANGEMENT INCLUDING MEANS TO VARY THE COMPRESSION RATIO

**Frank Moeller, Caterham, England, assignor to John Douglas Rees, Orpington, England**

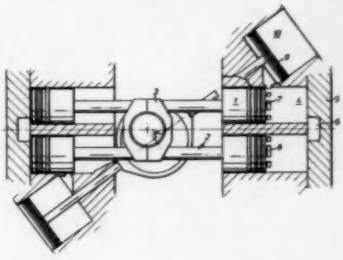
**Filed Jul. 9, 1981, Ser. No. 281,625**

**Claims priority, application United Kingdom, Jul. 18, 1980, 8023616**

**Int. Cl.³ F02B *75/04***

**U.S. Cl. 123—48 B** **4 Claims**

1. An internal combustion engine, comprising a first pair of working piston (1) and cylinder (4) assemblies disposed adjacent each other with their longitudinal axes parallel, a common combustion chamber (6) communicating with the cylinders of the pair of piston and cylinder assemblies, a big end bearing housing (3) to which each piston is rigidly connected, and a counter rotating crank drive having an inner crank (12), an eccentric (12*a*) being carried on the inner crank and being arranged to drive the pistons, the eccentric being rotatable within said big end bearing housing, and further comprising connecting means (2) connecting at least one piston of the pair of piston and cylinder assemblies to said bearing housing, said connecting means extending axially of said piston, said connecting means comprising a rigid tube (16) connected to one of the piston and the housing, and a rigid rod (17) connected to the other of the piston and the housing, the rod extending coaxially within the tube, interengaging means provided internally of the tube and externally of the rod and arranged to cause relative longitudinal movement of the rod and the tube upon relative rotation thereof, and means for causing relative rotation of the rod and the tube to selectively adjust the position of the piston within its cylinder and thereby vary the compression ratio of the pair of piston and cylinder assemblies, said means for causing relative rotation of said rod and said tube comprising longitudinally extending grooves (24) on the external surface of said tube and a worm spindle (18) engaged with said grooves, wherein a second pair of working piston and cylinder assemblies is disposed opposite to said first pair, and wherein one piston of each pair is connected to said bearing housing by respective connecting means and the other piston of each pair is connected to said bearing housing by a rigid tube (15) fixed to said piston and the housing and extending axially of said piston, an anti-fatigue bolt (19) extending coaxially within said tube over the whole length thereof, said anti-fatigue bolt being prestressed to keep the tube under compression, and further comprising a respective scavenging piston (9) and cylinder assembly (10) associated with the common combustion chamber of each pair of working piston and cylinder assemblies, each said scavenging piston and cylinder assembly being arranged adjacent the working piston and cylinder assembly of the respective pair provided with inlet ports (7), and wherein the longitudinal axes of said scavenging piston and cylinder assemblies are aligned, the longitudinal axis of each scavenging assembly being at an angle between 20° and 50° relative to the longitudinal axis of the associated pair of working piston and cylinder assemblies.



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**4,422,415**

## INTAKE SYSTEM OF ENGINES

**Noritaka Matsuo; Koichiro Takeuchi, both of Iwata, and Tokuji Muramatsu, Hamakita, all of Japan, assignors to Yamaha Motor Co., Ltd., Japan**

**Filed Jun. 26, 1981, Ser. No. 277,631**

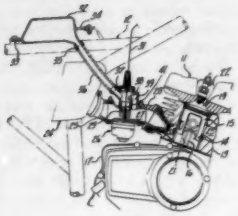
**Claims priority, application Japan, Jun. 28, 1980, 55-88067**

**Int. Cl.³ F02M *35/00***

**U.S. Cl. 123—52 M** **4 Claims**

1. An induction system for delivering intake charge to a variable volume chamber of an internal combustion engine

having an induction passage for supplying the total of the intake charge to said chamber, a throttle valve for controlling the flow through said induction passage, a plenum chamber, and means communicating said plenum chamber only with said induction passage between said throttle valve and said chamber, said communicating means and said plenum chamber providing for flow of a portion of said intake charge from said induction passage into said plenum chamber during a portion of the engine operating cycle and providing flow from said



plenum chamber to said induction passage of at least a part of said portion of said intake charge during at least a part of the induction cycle of said engine for supplementing the flow in said induction passage, and means for controlling the communication of said plenum chamber with said induction passage in response to a running condition of the engine comprising a control valve means operatively connected with said throttle valve and movable from an opened position when said throttle valve is in its idle position to a closed position when said throttle valve is in its fully opened position.

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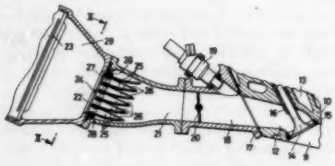
**4,422,416**

## INTAKE DUCT FITTED WITH NON-RETURN VALVE MEANS

**Luigi Bernardoni, Tradate, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy**

**Filed Sep. 30, 1981, Ser. No. 307,098**
**Claims priority, application Italy, Oct. 17, 1980, 25427 A/80**
**Int. Cl.³ F02B 77/00**
**U.S. Cl. 123—52 MF** **2 Claims**



1. An intake duct for feeding a mixture which comprises one of air and air-fuel from outside said intake duct to at least one cylinder of a four-stroke internal combustion engine, provided with at least one intake valve, characterised by being fitted with non-return valve means disposed in series with said at least one intake valve, said non-return valve means being arranged to allow mixture to flow in a direction to said at least one cylinder, being arranged to prevent backward flow of the mixture returned by said at least one cylinder, from said intake duct to the outside, said non return valve means being formed from a plurality of elastically flexible blades partly disposed side-by-side and partly superposed, and being connected to a support frame formed from a plurality of substantially parallel channels extending towards said at least one cylinder and being partly disposed side-by-side and partly superposed and disposed in the flow direction of the mixture feeding the engine, said blades being fixed to said frame so that they are also disposed in said flow direction in such a manner so as to close the relative channels when at rest.

**4,422,417**

## PULLBACK STARTER FOR INTERNAL COMBUSTION ENGINES

**Alfred Obermayer, Lambach, Austria, assignor to Bombardier-Rotax Gesellschaft m.b.H., Gunskirchen, Austria**

**Filed Feb. 3, 1982, Ser. No. 345,235**
**Claims priority, application Austria, Feb. 27, 1981, 910/81**
**Int. Cl.³ F02N 3/02**
**U.S. Cl. 123—185 BA** **2 Claims**

1. In a pullback starter for an internal combustion engine having a drive shaft carrying a driven coupling element, which starter comprises

a housing,

an axle disposed in, and fixed to, said housing,

a rope pulley rotatably mounted on said axle,

a rope wound on said pulley and adapted to be pulled from said pulley to rotate the same on said axle in a predetermined sense,

a pullback spring opposing a rotation of said pulley in said predetermined sense,

a driving coupling element mounted on said pulley for inward and outward pivotal movements on an axis which is parallel to and spaced from the axis of said axle, said driving coupling element being adapted to constitute an engageable and disengageable coupling element of a clutch comprising said driven coupling element,

a coil spring surrounding said axle and tending to embrace the same in frictional contact therewith so as to be braked against rotation on said axle, which spring is provided at opposite ends with first and second legs protruding from said axle,

a locking member rotatably mounted in said driving coupling element for rotation relative thereto between locking and unlocking positions, and engaged by said first leg,

a first stop carried by said driving coupling element,

a second stop carried by said locking member and so arranged that, when the latter is in its unlocking position, said second stop engages the first stop carried by said driving coupling element,

a third stop carried by said locking member and so arranged that, when the latter is in its locking position, it prevents pivotal movement of said driving coupling element, and

a further stop carried by said driving coupling element and adapted to engage said second leg in a sense tending to untwist said spring and to define said locking position,

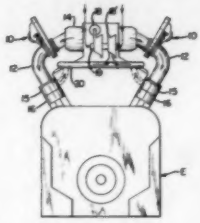
the improvement of a safety stop carried by said first leg and adapted to engage said second leg and to act on the latter in a sense tending to untwist said spring.

**4,422,418**

## EMERGENCY AIR SHUTDOWN SYSTEM FOR A DIESEL ENGINE

**Russell J. Dorn, Aurora, Colo., assignor to Condor Engineering & Manufacturing, Inc., Henderson, Colo.**

**Filed Aug. 20, 1981, Ser. No. 294,773**
**Int. Cl.³ F02B 77/08**
**U.S. Cl. 123—198 D** **13 Claims**



1. An emergency air shutdown system for a diesel engine wherein said engine has an air intake manifold and a plurality of discharge tubes for delivery of air from an air inlet into said manifold, said system comprising:

a valve member for each discharge tube;

means mounting each said valve member for movement perpendicular to the flow of air through said associated discharge tube between an open position, externally of said associated discharge tube and outside the path of air flow therethrough, and a closed position extending across said tube to block the flow of air therethrough;

locking means normally retaining each said valve member in said open position; and

activating means for each said valve member operative to advance said valve member from its normally open position to said closed position.

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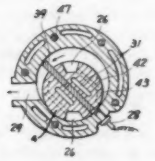
**4,422,419**

## ROTARY INTERNAL COMBUSTION ENGINE

**Soei Umeda, 10-14, Mitsuyaminami 3-chome, Yodogawa-ku, Osaka-shi, Japan**

**Filed Jul. 29, 1980, Ser. No. 173,494**
**Claims priority, application Japan, Oct. 15, 1979, 54-133343**
**Int. Cl.³ F02B 53/08**
**U.S. Cl. 123—235** **3 Claims**



1. A prime mover comprising:

a rotor having a compressor rotor part and a prime mover rotor part and a common shaft on which said rotor parts are mounted, the center of said rotor having a vane groove extending radially therethrough;

a vane movably mounted in said vane groove and constituted by two vane parts opposed to each other at the center of the vane in the radial direction thereof;

a compressor casing in which said rotor is rotatably mounted, said compressor casing having a lower inner wall part with a cross-sectional shape of part of a circle and with which said compressor rotor part is coaxially rotatable in close contact therewith, and an upper inner wall part with a cross-sectional shape of part of a shape which is approximately elliptical and the center of which is offset from the center of the circular cross-sectional shape in a direction away from said lower inner wall part, said vane having a diametrical dimension equal to the dimension across the elliptical cross-sectional shape through the center of the circular cross-sectional shape and perpendicular to the direction of the offset, said approximately elliptical cross-sectional shape having the diametrical dimensions through the center of the circular cross-sectional shape substantially equal to the diametrical dimension of said vane, and said upper inner wall part being at least the part of the entire inner wall which is on the side of center of the circular cross-sectional shape in the direction of offset of the center of the elliptical shape;

said compressor casing having a gas inlet opening through the upper inner wall part thereof;

a prime mover casing axially adjacent said compressor casing and having lower and upper inner wall parts similar in shape and in corresponding positions to the inner wall parts of said compressor casing, said prime mover rotor being coaxially rotatable in close contact with the lower circular cross-section shaped inner wall part of said prime mover casing;

ignition means in said prime mover casing directed into the space within said upper inner wall part thereof;

said prime mover casing having an exhaust port opening out of the upper inner wall part thereof;

a plate spring between said vane parts and urging said vane parts radially outwardly away from each other for improving the gas tightness between said vane parts and the inner walls of said casings;

means in the casing engaging said vane for limiting the radially outward movement of said vane; and

said rotors having two passages therein and extending between said compressor casing and said prime mover casing for conveying combustion gas from said compressor casing to said prime mover casing, there being one passage on each diametrically opposite side of said vane and being parallel with said vane groove and opening out of substantially diametrically opposite parts of the peripheries of said rotors, at least one end of said passage means being closed when the part of the periphery of said rotor from which it opens rotates in said lower parts of said casings and being opened when said part of the periphery of said rotor rotates in said upper parts of said casings.

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**4,422,420**

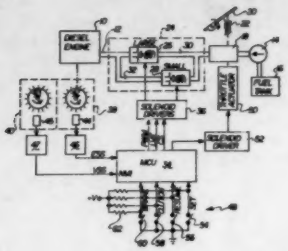
## METHOD AND APPARATUS FOR FUEL CONTROL IN FUEL INJECTED INTERNAL COMBUSTION ENGINES

**Joseph C. Cromas, Northville, and Charles M. McQuillan, Milford, both of Mich., assignors to TRW Inc., Cleveland, Ohio**

**Filed Sep. 24, 1981, Ser. No. 305,110**
**Int. Cl.³ F02D 33/00; F02M 37/04**
**U.S. Cl. 123—352** **26 Claims**

1. A method of controlling fuel flow from a fuel source to the fuel rail of a fuel injected, internal combustion engine comprising the steps of providing plural fuel flow paths connected in parallel between said source and said fuel rail, providing a control signal in accordance with which fuel flow is to

be controlled, controllably pulsing fuel flow through a first of said paths in accordance with said control signal, and providing fuel flow through a second of said paths when a characteristic of said control signal goes beyond a predetermined limit.



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**4,422,421**

## COMBUSTION KNOCK PREVENTING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

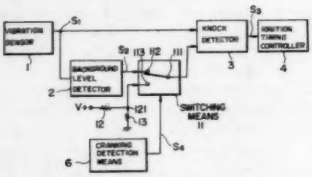
**Mitsuhiko Ezoe, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Nov. 28, 1980, Ser. No. 211,194**

**Claims priority, application Japan, Nov. 30, 1979, 54-165646[U]; Jun. 6, 1980, 55-77982[U]**

**Int. Cl.³ F02P 5/04**

**U.S. Cl. 123—424** **5 Claims**



1. A combustion knock preventing apparatus for an internal combustion engine, comprising:

an ignition system for the internal combustion engine;

a cranking operation detecting means for generating an output signal upon detecting the cranking operation of the internal combustion engine;

a vibration sensor means for sensing the vibration of the engine to generate an output signal indicative of the sensed vibration;

a background level detecting means for generating an output signal indicative of the background vibration of the internal combustion engine;

means for generating a constant signal which is higher than said output signal of said background level detecting means;

a knock detecting means having a first input connected to said vibration sensor means for receiving said output signal of said vibration sensor means and a second input receiving a reference signal, said knock detecting means comparing said output signal of said vibration sensor means with said reference signal supplied to said input signal to generate a knock detection signal when said output signal of said vibration sensor means is higher than said reference signal supplied to said input signal;

means responsive to said output signal of said cranking operation detecting means for supplying said output signal of said background level detector means to said second input of said knock detecting means as said reference signal in response to the absence of said output signal of said cranking operation detecting means and supplying said constant signal to said second input of said knock detecting means as said reference signal in response to the presence of said output signal of said cranking operation detecting means; and

means operatively connected with said ignition system for retarding the ignition timing in response to said knock detection signal.

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**4,422,422**

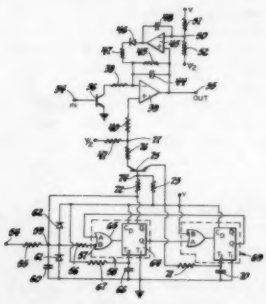
## COMBINED CLOSED LOOP AND ANTICIPATING KNOCK LIMITING SPARK TIMING SYSTEM

**Kenneth D. Mowery, Noblesville, and L. Joseph Pechous, Carmel, both of Ind., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Dec. 3, 1981, Ser. No. 326,848**

**Int. Cl.³ F02P 5/04**

**U.S. Cl. 123—425** **4 Claims**



1. A knock limiting spark timing system for an internal combustion engine subject to knock-induced vibrations and having means effective to generate spark events with a predetermined timing relative to crankshaft rotational position and further having means effective to selectively retard spark timing from the predetermined spark timing by a retard angle determined by a retard voltage, the system comprising in combination:

means effective to sense the knock-induced vibrations and generate a knock signal therefrom comprising voltage pulses indicative of knock intensity;

integrator means effective to generate the retard voltage from said knock signal, the integrator means having an integrating input adapted to receive the knock signal and a reference input normally provided with a constant predetermined reference voltage;

means responsive to a detected engine knock anticipating event to generate a step change, in the retard direction, to the voltage provided to the reference input of the integrator, whereby a similar step change in the retard direction is produced in the retard voltage and thus in the engine spark timing, whereby open and closed loop knock control signals are combined in an additive manner to form a single retard voltage.

4,422,423

## JET CONTROL TYPE CARBURETOR

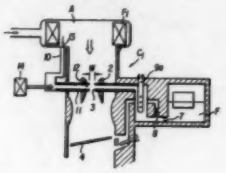
Katsuhiko Sugiyama, Aichi; Katsuyuki Ohsawa, Nagoya; Kenji Fujikake, Nagoya, and Yoshinori Idota, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenyusho, Aichi, Japan

Filed Apr. 16, 1980, Ser. No. 140,955

Claims priority, application Japan, Apr. 24, 1979, 54-50569; Apr. 28, 1979, 54-53247; Apr. 28, 1979, 54-53248; Sep. 10, 1979, 54-115986; Nov. 10, 1979, 54-145694; Dec. 29, 1979, 54-173567; Dec. 29, 1979, 54-173568

Int. Cl.³ F02B *33/00*; F02M *7/00*

U.S. Cl. 123—438 50 Claims



1. A jet control type carburetor comprising an intake pipe having an intake passage formed in an inner wall thereof, said intake passage allowing an intake air to flow therethrough;

a venturi provided in said intake pipe, for increasing flow velocity of said intake air in said intake passage to reduce the pressure thereof;

a fuel nozzle opened into said intake passage and connected to a fuel supply source through a fuel passage for supplying the fuel into said intake passage from said fuel nozzle in order to introduce the mixture of air and fuel into said intake passage;

a throttle valve provided downstream of said venturi, for controlling the flow rate of said mixture of intake air and fuel;

a control fluid nozzle opened into said intake passage at a point upstream from said throttle valve and including the position of said throttle valve, said control fluid nozzle being in coaxial opposition to said fuel nozzle, said control fluid nozzle being connected to a fluid supply source through a control fluid passage for directly jetting the flow of said control fluid to the fuel spurted from said fuel nozzle to afford a predetermined velocity component of said control fluid having a directional sense contrary to that of the spurted fuel thereby to cause said control fluid to impinge upon said fuel spurted from said fuel nozzle and to restrain the fuel flow rate from said fuel nozzle; and

a throttle means provided upstream of said control fluid nozzle in said control fluid passage, for controlling the flow rate of said control fluid in accordance with a driving condition of an engine;

whereby the fuel flow rate and the mixing condition of the fuel and the air are controlled over a wide range of the driving conditions of said engine with high stability and response by the predetermined velocity component of the control fluid so that the exhaust gas purification and the fuel consumption are improved by controlling accurately the air-fuel ratio of the intake mixture.

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4,422,424

## ELECTRONICALLY CONTROLLED FUEL INJECTION PUMP

Douglas A. Luscomb, Mt. Upton, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 23, 1981, Ser. No. 276,608

Int. Cl.³ F02M *51/00*

U.S. Cl. 123—447 25 Claims

1. A fuel injection pump (100) for supplying pressurized fuel to an engine, characterized by:

a housing assembly (38, 45, 46, 47, 48, 49) provided with an internal bore (17) defining a pressure chamber (44) having an inlet/outlet port (12) for receiving and discharging fuel and a metering chamber (16) having an inlet (53) for receiving a metered quantity of fuel and an outlet (26) for discharging pressurized fuel;

a plunger (2) connectibly driven by the engine for reciprocation in the pressure chamber;

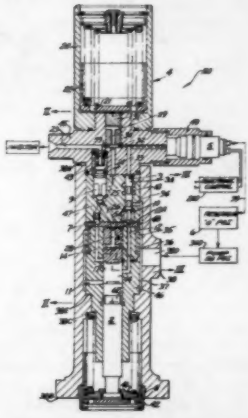
a floating piston (1) movably disposed within said bore in spaced relation to the plunger;

a spool valve chamber (18) located within said housing assembly and having a first port (12A) communicating with the pressure chamber port (12), a second port (56) communicating with the metering chamber inlet (53) and a drain outlet;

a spool member (3A) movable within the spool valve chamber (18) between seated and unseated positions;

an accumulator (4) pressurized by reciprocation of the plunger (2) to provide high pressure fuel to the pump, the accumulator providing fuel to the spool valve chamber and to the metering chamber and having a recess (59) for receiving a sufficient amount of pressurized fuel;

a pilot valve (5) adapted to be energized and de-energized to selectively establish first and second states of flow for communicating fuel between the accumulator (4) and the



spool valve chamber (18), the energized state causing the spool member to be seated and the de-energized state causing the spool member to be unseated;

a normally closed delivery valve (9) operable by a predetermined pressure to open and communicate the metered quantity of fuel in the metering chamber (16) through outlet (26) to the engine, this communication of the metered quantity of fuel representing an injection phase of the pump operation;

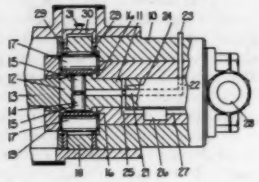
means for terminating (13, 27, 28) the injection phase as a result of piston (1) being displaced upwardly in the bore (17);

such that when the pilot valve (5) is energized, the spool member (3A) is seated and fuel communicates through the spool chamber into the metering chamber to displace piston (1) downwardly, during which time metering chamber (16) is filled with the metered quantity of fuel, whereupon the pilot valve is de-energized and the spool member is unseated, the plunger rises and pressurizes fuel in the pressure chamber (44) to the predetermined pressure, whereby the piston is displaced upwardly and the metered quantity of fuel is pressurized to the predetermined pressure to open the delivery valve and is discharged through the delivery valve to the engine.

## 4,422,425
## FUEL INJECTION PUMP

John R. Jefferson, Rainham, England, assignor to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 93,084, Oct. 2, 1980, abandoned. This application Mar. 14, 1983, Ser. No. 473,265
Claims priority, application United Kingdom, Oct. 20, 1979, 7936480
Int. Cl.³ F02B 23/10
U.S. Cl. 123—450 2 Claims

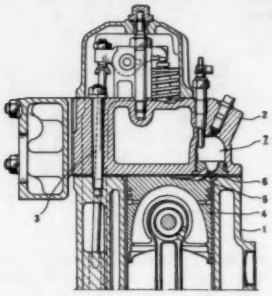


1. A liquid fuel injection pump for supplying fuel to a multi-cylinder internal combustion engine and of the kind comprising a rotary distributor member housed in a body and driven in use in timed relationship with an associated engine, a transverse bore formed in the distributor member and a plunger in said bore, a delivery passage communicating with the bore and arranged to register in turn with outlets in the body, as the distributor member rotates and during successive inward movements of the plunger, a cam ring surrounding the distributor member and having inwardly extending cam lobes for imparting said inward movements to the plunger, fuel supply means for supplying fuel to the bore during at least part of the time when the plunger is allowed to move outwardly by the cam lobes, said fuel supply means including an inlet port in the body to which fuel is supplied from a low pressure source, and an inlet passage in the distributor member for registration with said inlet port, flow control means for controlling the amount of fuel supplied through said port, control means for varying the maximum amount of fuel supplied to the engine automatically in accordance with engine speed during engine operation, said control means including stop means for limiting the outward movement of the plunger, said stop means comprising a ring mounted within the body of the pump and defining a stop surface which is engaged by a part associated with said plunger to limit the outward movement of the plunger, as the distributor member rotates, said stop surface being curved outwardly with respect to the plunger axis of rotation so that the distance of said surface from the axis of rotation of the plunger increases along the arcuate length of the surface, said stop surface including a first curved portion and a second curved portion which has a radius of curvature greater than the radius of curvature of said first curved portion, the contour of the second curved portion of the stop surface being such that as the speed of rotation of the distributor member increases the plunger can move off of said stop surface to no longer follow a path completely defined by said surface so that the extent of outward movement of the plunger is reduced as compared with the situation at lower speeds where the plunger remains in contact with said second curved portion to have the path of the plunger controlled entirely by the stop surface, whereby the maximum amount of fuel supplied to the engine is adjusted automatically in accordance with plunger angular speed with respect to said stop ring.

## 4,422,426
## ANTECHAMBER SYSTEM DIESEL ENGINE

Takanori Tsugekawa; Tosio Banba, and Masakuni Matsui, all of Osaka, Japan, assignors to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Division of Ser. No. 156,114, Jun. 3, 1980, Pat. No. 4,323,039. This application Dec. 23, 1981, Ser. No. 333,792
Claims priority, application Japan, Jun. 5, 1979, 54-76055
Int. Cl.³ F02B 3/00
U.S. Cl. 123—470 1 Claim

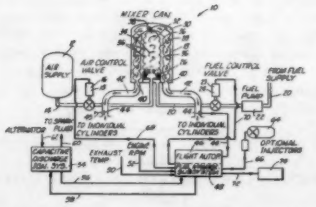


1. In a diesel engine having a fuel injection nozzle and an insertion hole, for mounting said fuel injection nozzle therein, said insertion hole having a first portion, a second portion with a diameter less than the diameter of said first portion, and a seat portion therebetween, a first heat insulating material member disposed on said seat portion in the first portion of said insertion hole, a second heat insulating material member separately formed from said first heat insulating material member and disposed in said second portion of said insertion hole to surround a portion of said fuel injection nozzle and to contact the inner surface of said insertion hole, and a deformable support means positioned entirely within the insertion hole between said first heat insulating material member and a step portion of said fuel injection nozzle.

## 4,422,427
## FUEL MANAGEMENT SYSTEM FOR AN AUTONOMOUS MISSILE

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 28, 1982, Ser. No. 343,557
Int. Cl.³ F02M 31/00, 29/06
U.S. Cl. 123—478 5 Claims



1. A fuel management system for an autonomous missile or the like, the missile having a flight autopilot microprocessor, the system delivering a turbulent air fuel mixture to the cylinders of an internal combustion engine, the system comprising:

an air supply with an air supply line;

an air control valve connected to the air supply line for controlling the flow of air;

a fuel supply with fuel supply line and fuel pump;
a fuel control valve connected to the fuel line for controlling the flow of fuel;
an enclosed air fuel mixer can having an inner container, an outer container and an atomizing orifice disposed at the bottom of the inner container, the atomizing orifice connected to the air and fuel supply lines for receiving and atomizing the air and fuel therein and discharing the mixture out the top thereof and into the inside of the inner container, the mixture discharged out the top of the inner container and downwardly between the outside of the inner container and the inside of the outer container and through discharge openings in the bottom of the outer container; and
manifolds connected to the discharge opening for delivering the air fuel mixture to the cylinders of the internal combustion engine.

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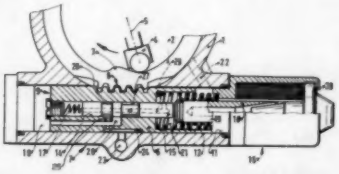
**4,422,428**

## FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

**Franz Eheim, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Jun. 7, 1979, Ser. No. 46,285**
**Claims priority, application Fed. Rep. of Germany, Sep. 7, 1978, 2839014**
**Int. Cl.³ F02M *59/20***
**U.S. Cl. 123—502** **5 Claims**



**1.** A fuel injection pump for internal combustion engines provided with a housing, a pressure operated adjusting piston correlated with a pressure chamber in said housing, a remotely positioned axially disposed piston restoring spring arranged to cooperate with said piston, a control plunger disposed coaxially with said adjusting piston, first means on said control plunger arranged to cooperate with second means on said adjusting piston and thereby adapted to control fluid flow into and out of said pressure chamber, whereby the control plunger is displaceable relative to the adjusting piston against the force of a control plunger restoring spring supported axially within said adjusting piston so that said control plunger is equalized in pressure via a longitudinal bore coaxial with said control plunger, further wherein said control plunger is adjustable by means of an electromagnet and a core relative thereto which directly engages one end of the control plunger via the force of a core spring which urges said core away from said electromagnet toward said control plunger.

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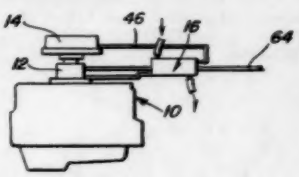
**4,422,429**

## FUEL HEATER

**Morgan P. Reed, 700 South Eastern, Rayne, La. 70578**

**Filed May 17, 1982, Ser. No. 379,008**
**Int. Cl.³ F02M *31/00, 27/00***
**U.S. Cl. 123—557** **8 Claims**

**1.** In an internal combustion engine including a fuel supply line, liquid coolant flow passages, and a manifold vacuum source, wherein the improvement comprises: a fuel heater for use in heating liquid fuel, said heater including an elongated hollow body defining a first central passage extending therethrough and first inner, second intermediate and third outer chambers disposed about said passage, first chamber and second chamber, respectively, with heater body wall portions of good heat transfer materials separating adjacent chambers and said first chamber from said passage, said passage including opposite liquid fuel inlet and outlet ends, a plurality of small diameter passages communicating longitudinally spaced portions of said passage with said first chamber, said second chamber including manifold vacuum air inlet and outlet means opening thereinto and said third chamber including liquid engine coolant inlet and outlet means opening thereinto.

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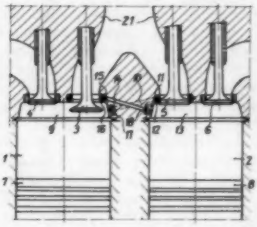
**4,422,430**

## METHOD AND A SYSTEM FOR THE CREATION OF TURBULENCE AND GASIFICATION OF THE AIR-FUEL MIXTURE

**Wieslaw Wiatrak, Bielsko-Biala, Poland, assignor to Osrodek Badawczo-Rozwojowy Samochodow Malolitrazowych Bosmal, Poland**

**Filed Oct. 1, 1981, Ser. No. 307,623**
**Claims priority, application Poland, Nov. 28, 1980, 228178**
**Int. Cl.³ F02M *25/06***
**U.S. Cl. 123—568** **4 Claims**

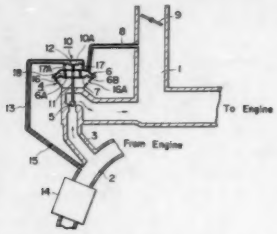



**1.** A system for the creation of turbulence and gasification of the air-fuel mixture in a spark-ignition four-stroke internal combustion engine with an even number of cylinders, in which cylinders co-operating with each other constitute pairs of a synchrous motion of pistons, whereof when in one a working stroke is performed, then in the other one a suction stroke is performed, whereby said cylinders are connected with each other so that the working space of the first cylinder is connected by means of an annular passage surrounding the seat of the suction valve of the other cylinder and vice versa, whereby the annular passages surrounding the seats of suction valves, made in the material of a valve and/or a head, are connected with exhaust ducts widening in the direction of their outlets situated in faces of the seats of the suction valves, characterized in that conduits (**10, 14**) connecting combustion chambers (**9, 13**) with annular passages (**11, 15**) surrounding seats (**12, 16**) of suction valves (**3, 5**), are made in the material of a head (**21**) or are in a form of pipes, whereby their inlets situated in walls of the combustion chambers (**9, 13**) are provided with inserts (**17**) with a throttle nozzle (**18**), situated preferably as close as possible to walls of the combustion chambers (**9, 13**).

## 4,422,431
## EXHAUST GAS RECIRCULATION SYSTEM FOR INTERNAL COMBUSTION ENGINE

**Kichihiko Dozono, Yokosuka, and Yoji Hasegawa, Yokohama, both of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan**

**Filed Jan. 29, 1982, Ser. No. 343,852**
**Claims priority, application Japan, Feb. 8, 1981, 56-22659**
**Int. Cl.³ F02M *25/06***
**U.S. Cl. 123—568** **5 Claims**




1. In an internal combustion engine including an intake passage provided with a throttle valve, and an exhaust gas passage provided with a particle trap for catching particles entrained by exhaust gas discharged from said internal combustion engine, an exhaust gas recirculation system comprising:

an exhaust gas recirculation passage connected between said intake passage at a position downstream of said throttle valve and said exhaust gas passage at a position upstream of said particle trap so as to permit recirculation of the exhaust gas to said intake passage therethrough;

a control valve means provided in said exhaust gas recirculation passage for controlling the recirculation of the exhaust gas to said intake passage through said exhaust gas recirculation passage; and

a valve actuator means operatively coupled for controlling said control valve means, said valve actuator means being responsive to a vacuum pressure prevailing in said intake passage at a region downstream of said throttle valve and upstream of the position where said exhaust gas recirculation passage is connected to said intake passage and also responsive to a pressure prevailing in said exhaust gas passage at a region upstream of said particle trap, thereby causing said control valve means to be actuated to control the recirculation of the exhaust gas substantially in dependence on said intake passage vacuum pressure, while at the same time ensuring the the recirculation of the exhaust gas controlled by said control valve means is substantially insusceptible to the pressure of the exhaust gas in said exhaust gas passage being increased beyond a predetermined level as a result of said particle trap being clogged.

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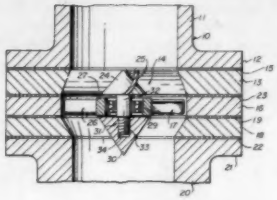
## 4,422,432
## VARIATION OF FUEL VAPORIZER FOR INTERNAL COMBUSTION ENGINE

**Kenneth L. Knox, Sr., 1796 Hillboro Ave., Reno, Nev. 89512**

**Filed Oct. 23, 1980, Ser. No. 199,713**
**The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.**
**Int. Cl.³ F02M *29/00***
**U.S. Cl. 123—592** **11 Claims**

1. In a variation of a fuel vaporizer for internal combustion engines, including a carburetor and an intake manifold, inlet guide vane assembly means carried in a discrete housing member and disposed below said carburetor and above said intake manifold and defined by an opening within said discrete housing member, plural stationary spaced vanes extending across said opening and obliquely angled relative to the direction of flow of fuel and air passing from the carburetor to the intake manifold supported by said housing member, turbine means disposed between said guide vane assembly means and said intake manifold wherein said turbine means includes an impeller embodying a hub, an internal bearing in said hub and a discrete turbine housing surrounding and supporting said impeller oriented in serial registry with said housing member and intake manifold, said inlet guide vane assembly means changes



the flow direction of air and fuel before it impinges upon said turbine means to provide better atomization of fuel and a portion where said turbine housing communicates with said stationary vane housing defining a transition pressure area where air/fuel proceeds from a high pressure area to a low pressure area in said turbine housing for improved atomization by flash misting.

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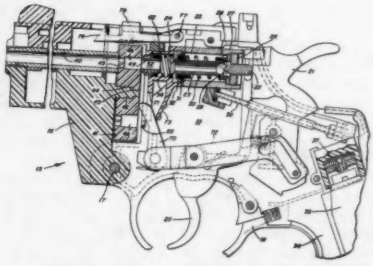
## 4,422,433
## PROJECTILE LOADER AND DETENT ASSEMBLY FOR GUNS

**Keith Milliman, Fairport, N.Y., assignor to The Coleman Company, Inc., Wichita, Kans.**

**Filed May 24, 1982, Ser. No. 381,150**
**Int. Cl.³ F41B *11/06***
**U.S. Cl. 124—74** **11 Claims**



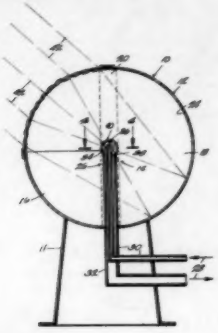
1. A gas-powered gun having a barrel and means for supplying pressurized gas and a projectile loader assembly therefor, the loader assembly comprising a loader having a plurality of projectile ports, the loader being movably mounted in the gun to permit the projectile ports to be aligned with the barrel, a detent holder connected to the gas-supplying means, a detent mounted in the detent holder in alignment with the barrel, the detent having an end portion which is engageable with the projectile ports of the loader, and means for urging the detent against the loader whereby the detent provides a retaining force on the loader when a projectile port is aligned with the barrel, the detent being provided with a gas passage therethrough whereby pressurized gas can flow from the detent holder to the projectile port when the gun is fired.

4,422,434

## SOLAR ENERGY COLLECTION APPARATUS

Robert G. Statz, and William W. Belson, both of Milwaukee, Wis., assignors to Capitol Stampings Corp., Milwaukee, Wis.

Filed May 6, 1982, Ser. No. 375,461
Int. Cl.³ F24J 3/02
U.S. Cl. 126—438 8 Claims



1. An apparatus for collecting solar energy comprising:
an energy receiving means;
a circulating means connected to said energy receiving means for circulating a heat absorbing fluid through said receiving means; and
a hollow, generally spherical means with said energy receiving means positioned substantially at the center thereof, said hollow, generally spherical means including a leanse means forming a portion of said spherical means and located in the upper portion thereof, said lenses means positioned to direct and concentrate sun rays onto said energy receiving means and onto the inner surface of said spherical means, said inner surface of said spherical means upon which sun rays are directed by said lenses means including a reflective material to thereby reflect said sun rays impinging upon said inner surface back to said energy receiving means.

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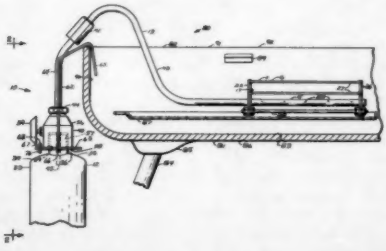
4,422,435

## PORTABLE CHARCOAL IGNITERS OR IGNITION SYSTEMS AND APPARATUS RELATING THERETO

William D. Spell, P.O. Box 1734, Eustis, Fla. 32726

Filed Apr. 24, 1981, Ser. No. 257,487
Int. Cl.³ F24B 3/00
U.S. Cl. 126—25 B 2 Claims



1. In a portable charcoal briquette ignition system having a pressurized gaseous fuel container, a burner with a plurality of gas discharge orifices, and conduit means interconnecting the burner and gaseous fuel container for delivering the gaseous fuel to said burner, the improvement wherein said burner includes means forming said plurality of gas discharge orifices, and a metal cage that is fixed to the orifice forming means and thereabout defines a zone for the combustion of gaseous fuel discharged from the orifices, said cage is adapted and arranged to rest on an underlying support surface and to support the briquettes in a pile of charcoal briquettes heaped about the cage spacedly apart from said discharge orifices, said conduit means and orifice forming means provides an air tight passageway between said fuel container and said orifices whereby the admixture of air with gaseous fuel burned at said burner transpires in said combustion zone, said orifice forming means is an elongated, linearly extending metal tube section, said cage comprises elongated, linearly extending metal elements that are laterally offset from and fixed in parallel with said tube section, said conduit means has a valve component that is secured to said container and manipulatable to control the flow of gaseous fuel into said air tight passageway, and wherein said improvement further comprises a hanger for suspending the container from the side wall of a brazier, said gaseous fuel container having a shoulder forming end portion, and a neck piece extending upwardly from said shoulder, said valve component being secured to said neck piece and having an outer casing with a socket in which the neck piece is received, and an annular lower edge that is spaced apart from the shoulder and surrounds the neck piece at the mouth of the socket, said hanger having a flat U-shaped member which is adapted and arranged to straddle the neck piece and underlie the annular lower edge between the outer casing and the shoulder, thereby to support the container through the valve component secured to the neck piece thereof, and means engagable with the side wall of a brazier and connected to said member for suspending said member and the container supported thereby from said side wall.

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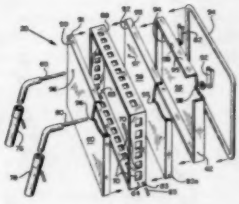
4,422,436

## JACKETED WOOD STOVE

Joseph G. Chamberlain, 12350 SW. 124th, Tigard, Oreg. 97223

Continuation of Ser. No. 131,214, Mar. 17, 1980, abandoned.
This application Mar. 22, 1982, Ser. No. 360,425
Int. Cl.³ F24C 1/14
U.S. Cl. 126—61 4 Claims

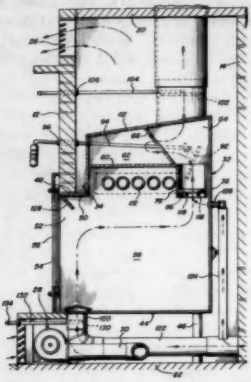


1. In a wood stove having a firebox which includes a frontal access opening and a door adapted to close said frontal access opening, a door comprising:
inner and outer walls spaced apart to define a door airspace; and
a peripheral wall interconnecting said inner and outer walls thereof in spaced-apart parallel relationship to define said door airspace;
said peripheral wall having upper and lower air openings for admitting ambient air to flow vertically through said door airspace to internally convectively cool said outer wall;
said inner wall of said door including a double-layered portion spaced inwardly from said peripheral wall surrounded by perimeter sealing means for sealing said inner wall against said frontal access opening of the stove, said double-layered portion protruding oppositely of said outer wall so as to fit within said opening, said double layers of said inner wall being spaced apart to define a second airspace.

## 4,422,437
## CATALYTIC FIREBOX

Dareld A. Hirschey, 121 6th Ave., SE., Glenwood, Minn. 56334

Filed Apr. 11, 1983, Ser. No. 483,539
Int. Cl.³ F24C 1/14
U.S. Cl. 126—77 12 Claims



1. A catalytic firebox including a housing defining a closed lower combustion chamber, a closed upper afterburn chamber disposed above said combustion chamber with one marginal portion of said combustion chamber projecting horizontally outwardly beyond the corresponding marginal portion of said afterburn chamber and a combined flue gas and bypass chamber disposed above said one marginal portion of said combustion chamber and horizontally registered with said afterburn chamber, means dividing said combined chamber into central and remote portions spaced along said one marginal portion, a pair of first port means communicating said remote portions of said combined flue gas and bypass chamber with corresponding remote upper portions of said combustion chamber, a pair of second port means communicating said remote portions of said combined flue gas and bypass chamber with corresponding remote portions of said afterburn chamber, third port means communicating a central portion of said afterburn chamber with said central portion of said combined flue gas and bypass chamber, fourth port means communicating said central portion of said combined flue gas and bypass chamber with a central upper portion of said one marginal portion of said combustion chamber, and catalytic combuster means disposed in said first port means, damper means operatively associated with said fourth port means for variably opening and closing the latter, flue gas outlet means opening outwardly of said central portion, combustion air inlet means opening into said combustion chamber, and supplemental combustion air inlet means opening into said combustion chamber closely adjacent said combuster means.

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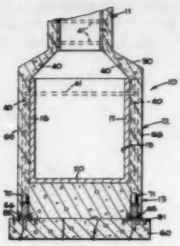
## 4,422,438
## PREFABRICATED FIREPLACE AND THE INSTALLATION THEREOF

Ray J. Scholz, and William C. Southern, both of Los Gatos, Calif., assignors to Sierra Precast, Inc., San Jose, Calif.

Continuation of Ser. No. 877,088, Feb. 13, 1978, Pat. No. 4,384,565. This application Mar. 7, 1983, Ser. No. 472,741
The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.
Int. Cl.³ F24B 1/18; E04G 2/00
U.S. Cl. 126—120 8 Claims

1. A method of installing a precast, cementitious, prefabricated fireplace comprising the steps of:

(a) placing a precast, cementitious, prefabricated fireplace with a weld plate fixed at the lower surface of a cementitious base thereof onto a cast, cementitious fireplace foundation with a weld plate fixed at the upper surface thereof; and



(b) welding said plates to one another.

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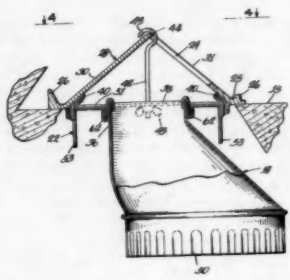
## 4,422,439
## FIREPLACE ADAPTERS

Richard L. Hunt, Warren, Ohio, assignor to David C. Frazier, Southington, Ohio

Filed Nov. 6, 1980, Ser. No. 204,471
Int. Cl.³ F24B 7/00
U.S. Cl. 126—123 8 Claims



1. An adapter for use in connecting the combustion outlet of a stove to the chimney flue of a fireplace, said flue including a metal damper frame having a lower peripheral portion defining a mouth opening into said fireplace and an upper peripheral portion defining an opening to a chimney flue, said lower portion being connected to walls defining said fireplace to span said flue for passage of products of combustion therethrough, said adapter comprising:

a metal body having a planar portion underlying said damper frame lower portion and having an upper surface adapted to engage an undersurface of said damper frame at the periphery thereof surrounding said mouth, said planar portion of said adapter having an opening in line and communicating with said mouth,

a tubular metal boot adapted to have one end connected to said stove combustion outlet to receive products of combustion therefrom, said boot having its other end adapted for connection to the planar portion of said adapter in a manner to limit passage of products of combustion from said stove through said boot and adapter opening and through said damper frame mouth to and through said chimney flue, and

tension means connected between said adapter body and said damper frame upper portion, said tension means extending through said chimney flue opening thereof for engagement there at and through said damper frame lower mouth opening, and operable to draw said adapter body upwardly to

press the upper surface of said adapter planar portion against the undersurface of said damper frame portion to restrict escape of combustion products through the engaging surfaces of said adapter and said damper frame, said tension means being free of any components extending downwardly any substantial distance from said adapter body, thereby to provide unobstructed access to said boot and to a said stove associated with the fireplace.

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**4,422,440**

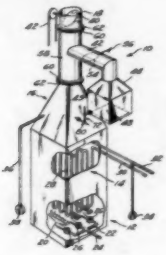
## AUTOMATIC DRAFT CONTROLLER

**Robert J. Russell, 1332 Lymric Way, Bakersfield, Calif. 93309**

**Division of Ser. No. 124,089, Feb. 25, 1980, Pat. No. 4,341,344. This application Jan. 29, 1982, Ser. No. 343,778**

**Int. Cl.³ F23N *3/00***

**U.S. Cl. 126—292** **4 Claims**



1. A method for draft control in a furnace having air regulators on its burners and a draft control plate mounted so as to be in communication with its flue, comprising the steps of:

(a) initially setting said plate in a closed position to permit the purging of said furnace;

(b) adjusting the air regulator to be approximately half open;

(c) initially setting said plate partially open to permit it to automatically open or close in response to changes in draft velocity due to changes in ambient and/or operating conditions;

(d) starting the furnace and monitoring the efficiency of its combustion;

(e) adjusting the position of said plate so that efficient operating conditions are achieved in said furnace while at the same time said air regulators are approximately half open; and

(f) adjusting the air regulators to maintain said efficient operating conditions.

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**4,422,441**

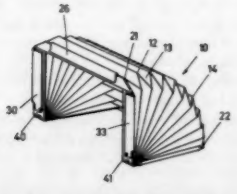
## DISPOSABLE STACKABLE SPLATTER SHIELD AND FRAME THEREFORE

**Erich G. Schoepe, P.O. Box 842 Station 'A', Scarborough, Ontario, Canada**

**Filed Jun. 22, 1981, Ser. No. 275,821**

**Int. Cl.³ F24C *15/20***

**U.S. Cl. 126—299 C** **1 Claim**




1. In a splatter or cooking-shield assembly for positioning around and over a source of heat such as an electric cooking element, and for partially enclosing a vessel placed on said element, comprising:

a semi-permanent disposable, collapseable shield of metallic foil formed into pleated walls and presenting, when collapsed, an accordian-shaped approximately U-shaped or half circular body capable of being stacked and packaged in multiples, and when opened presenting an open-fronted enclosure of approximately quadri-cylindrical or quadri-spherical configuration, said walls creating a free standing shield;

a frame for said shield comprising two essentially similar and approximately U-shaped or half circular shaped supporting elements, having free ends hingeably connected so as to maintain said elements in a closed or collapsed position in which said elements lie flat and interfacing or an open position at right angles to each other; and

clip means for attaching said shield to said frame.

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**4,422,442**

## WARMING JUG

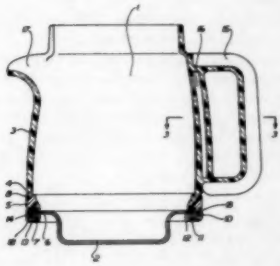
**Franz Gutmann, Rebstein, and Peter Sieber, Widnau, both of Switzerland, assignors to Platson AG Kunststoffwerke Hans Frei & Sohne, Widnau, Switzerland**

**Filed Jun. 22, 1981, Ser. No. 275,495**

**Claims priority, application Switzerland, Oct. 28, 1980, 8014/80**

**Int. Cl.³ A47J *27/00***

**U.S. Cl. 126—390** **6 Claims**



1. A warming jug adapted to be placed on a warming plate, said jug comprising a synthetic main body defining at least partially an interior cavity in said warming jug, said main body having a main portion and a lower end portion, a metal bottom forming the bottom of said cavity, a synthetic intermediate ring member located between said main body and said metal bottom and connected with said lower end portion of said main body, a synthetic closure ring member connected with said synthetic intermediate ring member, said metal bottom having a central portion located below said closure ring member, and said synthetic intermediate ring member and closure ring member having opposed faces clampingly engaging opposite surfaces of the outer portion of said metal bottom therebetween which outer portion is located at the perimeter of said metal bottom.

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**4,422,443**

## SOLAR COLLECTOR

**John E. Arendt, Rte. #1 Box 126, Chaffee, Mo. 63740**

**Filed May 5, 1981, Ser. No. 260,713**

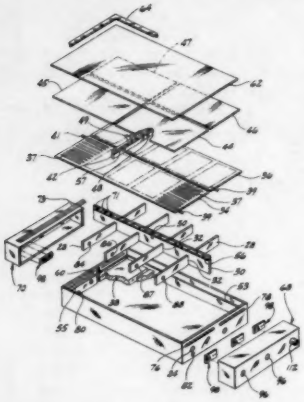
**Int. Cl.³ F24J *3/02***

**U.S. Cl. 126—418** **30 Claims**

1. A solar collector device comprising an elongated housing structure having a bottom wall, opposed side walls, and first and second end walls, a first glazing member mounted closing the top portion of said housing structure, a second glazing

member disposed inwardly of the first glazing member forming an air space therebetween, an absorber member disposed in the housing structure between the second glazing member and the bottom wall, first and second end closure members attached respectively to said first and second end walls, each of said end closure members including means forming an enclosed space adjacent the respective end wall, means associated with the respective end walls communicating the air space between the glazing members with the enclosed spaces formed by the end closure members, and means on each of said end closure members for controllably communicating the enclosed spaces formed by the end closure members to atmosphere to limit the maximum temperature that can occur in the space between the glazing members, said first and second end closure members being movable between a first position wherein said end closure members lie adjacent to the respective end walls and a second position providing access to the respective end walls.

22. A solar collector device comprising an elongated hous-



ing structure having a bottom wall, opposed side walls, and first and second end walls, a first glazing member mounted closing the top portion of said housing structure, a second glazing member disposed inwardly of the first glazing member forming an air space therebetween, an absorber member disposed in the housing structure between the second glazing member and the bottom wall, first and second end closure members attached respectively to said first and second end walls, each of said end closure members including means forming an enclosed space adjacent the respective end wall, means associated with the respective end walls communicating the air space between the glazing members with the enclosed spaces formed by the end closure members, and means on each of said end closure members for controllably communicating the enclosed spaces formed by the end closure members to atmosphere to limit the maximum temperature that can occur in the space between the glazing members, said solar collector including heat absorbing means positioned in at least one of said end closure members to heat the space enclosed thereby.

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**4,422,444**

## SOLAR ENERGY CONTROL SYSTEM AND METHOD

**William Webb, Jr., 272 A S. Monaco Pkwy., Denver, Colo. 80224**

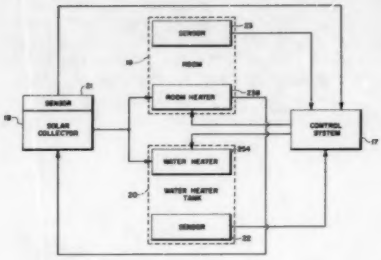
**Filed Mar. 26, 1981, Ser. No. 247,661**
**Int. Cl.³ F24J** *3/02*
**U.S. Cl. 126—422** **28 Claims**

1. A solar energy control system, comprising:

first means adapted to provide an indication of availability of heat derived from a solar collector;

second means adapted to provide separate indications of heat needs at each of a plurality of defined areas, said defined areas including a room and a water heater; and

processing means for receiving said indications from said first and second means and responsive thereto providing control outputs for enabling application of heat, when indicated to be available from solar energy, to said defined areas indicating heat needs, said processing means including determining means for causing heat to be applied at




any given time to that one of said defined areas that enhances the efficiency of said solar collector and for controlling the application of heat to said defined areas needing heat consistent with heat availability so that water in said water heater is caused to be heated prior to heating of air in said room when said water is sensed to be colder than said air and sufficient heat is available at said solar collector to heat said water.

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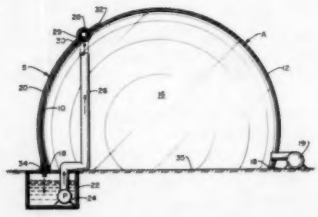
**4,422,445**

## INFLATION SUPPORTED SOLAR COLLECTOR

**Ronald L. Pelley, 760 E. Telegraph Rd., Fillmore, Calif. 93015**

**Continuation of Ser. No. 154,808, May 30, 1980, abandoned.**
**This application Feb. 8, 1982, Ser. No. 346,519**
**Int. Cl.³ F24J** *3/02*
**U.S. Cl. 126—426** **1 Claim**



1. A solar energy collecting apparatus comprising:

a thin, flexible walled housing;

an air blower connected to said housing, said air blower to inflate said housing forming a rigid walled structure, with said housing located on a supportive surface said housing forming a totally enclosed chamber, said rigid walled structure having an interior surface and an exterior surface, said interior surface defining the extremity of said totally enclosed chamber;

a strip of sheet material mounted on a portion of said exterior surface of said rigid walled structure, a narrow chamber being formed between said strip and said exterior surface, said strip having a top edge and a bottom edge, said top edge located a substantial distance from said supportive surface;

a liquid inlet pipe mounted within said narrow chamber, said liquid inlet pipe located at said top edge;

a reservoir, said reservoir to contain a liquid; means connecting said liquid inlet pipe to said reservoir; and

a discharge opening attached to said bottom edge connecting with said narrow chamber, said liquid to be conducted through said inlet pipe into said narrow chamber and through said discharge opening into said reservoir.

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**4,422,446**

## SOLAR FURNACE APPARATUS

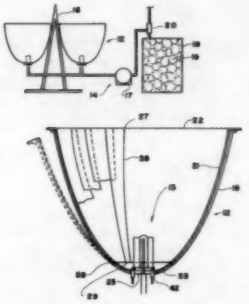
**Benjamin W. Strickland, P.O. Box 30, Joliet, Mont. 59041**

**Continuation-in-part of Ser. No. 64,493, Aug. 7, 1979, Pat. No. 4,291,678. This application Sep. 28, 1981, Ser. No. 306,168**

**The portion of the term of this patent subsequent to Sep. 29, 1998, has been disclaimed.**

**Int. Cl.³ F24J 3/02**

**U.S. Cl. 126—438** **9 Claims**



**1.** A solar furnace apparatus including a reflector portion, a collector portion and a fluid transfer portion; said reflector portion including a generally dish-shaped reflective member, said reflective member having a conic section configuration with a large open face and a highly reflective internal surface, said reflective member including a fixed base section concentric with the axis of said reflective member, a plurality of movable curved segments extending from said fixed base section to the free edge of said open face of said reflective member, the end of each segment adjacent to said fixed base section being pivotally connected thereto; said collector portion being disposed along the axis and the focal point of said reflective member, said collector portion including a chamber formed of a plurality of concave longitudinal conductive metal sections joined at their edges, the cross section of said longitudinal sections forming a generally star-shaped configuration, said concave longitudinal sections being disposed substantially parallel to the longitudinal axis of said reflective member, end sections affixed to the free edges of said concave longitudinal sections and therewith forming an enclosed chamber, a central conduit means extending from one of said end sections to a point adjacent the other end section but spaced therefrom, a plurality of discrete longitudinal baffle means disposed within said chamber around said central conduit means, inlet and outlet means communicating with said chamber, mounting means for the securing of said collector portion adjacent the apex of said reflective member; said fluid transfer portion including conduit means connected to said inlet and outlet means of said collector portion and means associated with said conduit means for circulating fluid to heat storage or heat dissipating means.

**4,422,447**

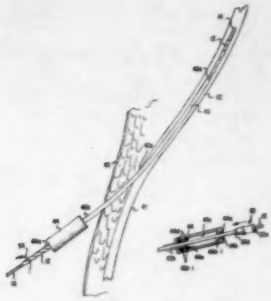
## PERCUTANEOUS BALLOON

**Peter Schiff, Rte. 7, Cookeville, Tenn. 38501**

**Filed Apr. 13, 1981, Ser. No. 253,680**

**Int. Cl.³ A61B 19/00; A61M 25/00**

**U.S. Cl. 128—1 D** **2 Claims**



**1.** An intra-aortic balloon assembly comprising:

an elongated intra-aortic balloon means having a distal end and a proximal end;

said distal end terminating in a tip;

coupling means being joined to said proximal end for introducing pulsatile pressure through said coupling means to said balloon means for selective inflation and deflation of said balloon means;

elongated catheter means extending between said coupling means and said intra-aortic balloon means;

catheter adapter means slidably mounted on said catheter means for providing a slidable liquid-tight seal between said catheter adapter means and said catheter means;

an elongated percutaneous sheath having a first end for insertion into a vessel and having a second end for receiving an intra-aortic balloon;

a percutaneous sheath collar secured to said second end;

said percutaneous sheath collar having a hollow interior, a first end of said percutaneous sheath collar being joined to said percutaneous sheath and a second end thereof being provided with resilient locking means;

said catheter adapter means being slidable through said second end past said locking means and into the hollow interior of said percutaneous sheath collar whereby said adapter means is fully enclosed by said percutaneous sheath collar and said locking means retains said catheter adapter means within said percutaneous sheath collar and whereby said percutaneous sheath collar and said catheter adapter means cooperate to provide a second liquid-tight seal between said sheath and said adapter means.

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**4,422,448**

## MASSAGING APPARATUS

**Haruo Sugai; Takafumi Hamabe; Yukio Yamamura; Shinpei Otuka, and Hiroshi Moriwaki, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan**

**Filed Dec. 22, 1981, Ser. No. 333,566**

**Claims priority, application Japan, Aug. 20, 1981, 56-130628**

**Int. Cl.³ A61H 7/00**

**U.S. Cl. 128—44** **21 Claims**

**1.** A massaging apparatus comprising:

a main shaft being capable of forward and reverse rotation,

a pair of massaging wheels spaced a certain distance apart and attached to said main shaft,

a position changing means for shifting said massaging wheels in a direction crossing the axis of said main shaft so as to change the position of the massaging wheels,

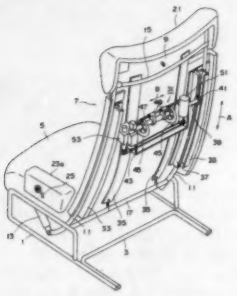
a spacing changing means for moving said massaging wheels axially of said main shaft to change the spacing thereof,

massage mode designating means for designating a mode of massage by said pair of massaging wheels, said message mode being determined by such elements as at least the position, spacing and direction of rotation of said massaging wheels,

position detecting means for detecting the position of said massaging wheels,

spacing detecting means for detecting the spacing of said massaging wheels,

control means for controlling said position changing means and said spacing changing means in connection with said



message mode designating means, said position detecting means and said spacing detecting means to adapt said massaging wheels to the selected massage mode,

preparation completion detecting means for detecting the completion of preparatory operation when the position and spacing of said massaging wheels are adapted to a selected massage mode by said control means,

rotary drive means for driving said main shaft for rotation, and

rotative direction control means for controlling said rotary drive means in connection with said preparation completion detecting means to rotate said main shaft in a direction suited for a selected massage mode.

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**4,422,449**

## MASSAGING APPARATUS

**Takafumi Hamabe, Hikone, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan**

**Filed Dec. 22, 1981, Ser. No. 333,635**
**Claims priority, application Japan, Dec. 29, 1980, 55-188536**
**Int. Cl.³ A61H *7/00***
**U.S. Cl. 128—44** **2 Claims**

1. A massaging apparatus comprising:

a main shaft,

a pair of massaging wheels spaced a certain distance apart and attached to said main shaft,

a position changing means for shifting said massaging wheels in a direction crossing the axis of said main shaft so as to change the position of the massaging wheels,

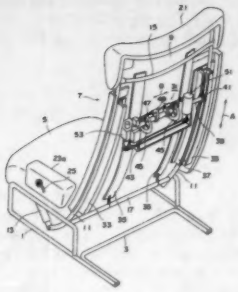
a spacing changing means for moving said massaging wheels axially of said main shaft to change the spacing thereof,

massage mode designating means for designating a mode of massage by said pair of massaging wheels, said massage mode being determined by such elements as at least said position and spacing of said massaging wheels,

position detecting means for detecting the position of said massaging wheels,

spacing detecting means for detecting the spacing of said massaging wheels, and

control means for controlling said position changing means and said spacing changing means in connection with said massage mode designating means, said position detecting



means and said spacing detecting means to adapt said massaging wheels to the selected massage mode.

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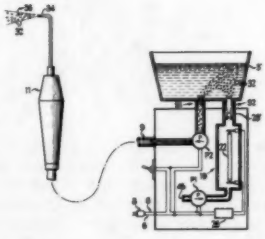
**4,422,450**

## ACTINIC OZONE PERIODONTAL IRRIGATING APPARATUS AND METHOD

**Robert K. Rusteberg, Barrington Hills, Ill., assignor to Panlmatic Company, Elk Grove Village, Ill.**

**Filed Jul. 28, 1982, Ser. No. 402,792**
**Int. Cl.³ A61H *7/00***
**U.S. Cl. 128—62 A** **14 Claims**



10. A method for treatment of periodontal infections, said method comprising the steps of:

preparing a dispersal of bubbles of actinic ozone in a quantity of liquid, said actinic ozone being of the variety produced by irradiation of air by radiation having a substantial energy content at wavelengths in the vicinity of 145 nanometers; and,

dispensing said dispersal and liquid under pressure directly to the periodontal region to be treated.

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**4,422,451**

## SPINAL COMPRESSION AND DISTRACTION INSTRUMENTATION

**Ali Kalamchi, 1313 Delaware Ave., Wilmington, Del. 19806**

**Filed Mar. 22, 1982, Ser. No. 360,470**
**Int. Cl.³ A61F *5/00*; A61B *17/00***
**U.S. Cl. 128—69** **15 Claims**

1. A hook for spinal compression and distraction instrumentation comprising a main body section having a pair of opposite side surfaces, opposite top and bottom surfaces, and opposite front and rear surfaces, hook means connected to and extending from the front surface of the main body section, a longitudinal passageway completely extending through the main body section from the top surface thereof to the bottom surface thereof, the longitudinal passageway including front and rear

portions, and a slotted opening in one of the side surfaces extending from the top surface of the main body section to the bottom surface thereof, the slotted opening communicating

with the front portion of the longitudinal passageway and positioned closer to the hook means than the rear portion of the longitudinal passageway.

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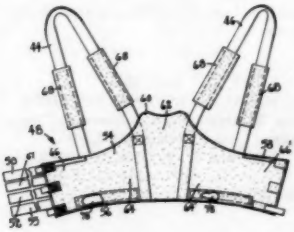
**4,422,452**

## GRAVITY TRACTION VEST

**Charles V. Burton, Excelsior, Minn., assignor to Abbott-Northwestern Hospital, Inc., Minneapolis, Minn.**

**Filed Sep. 8, 1981, Ser. No. 299,679**
**Int. Cl.³ A61H *1/02***
**U.S. Cl. 128—75** **6 Claims**



1. A gravity traction vest for secure attachment to a patient, the patient having a torso with a rib cage having a plurality of ribs including a lowest rib, said vest adapted to be secured to the patient and attached to a support structure whereby the patient is suspended from the support structure with the head of the patient in an upward direction, said vest comprising:

(a) a torso surrounding member having upper and lower edges and inner and outer surfaces for encircling the torso and rib cage of the patient;

(b) support means cooperatively connected to said member and adapted to be attached to the support structure for suspending said member from the support structure and applying a uniform force on said member in said upward direction;

(c) attachment means for securing said member to the patient; and

(d) a flexible cushion insert means extending along at least a portion of said lower edge of said inner surface of said member and protruding inwardly toward the patient for engagement below the lowest rib, wherein when said vest is attached about the patient's rib cage, substantially said entire insert means is positioned below the lowest rib and said insert means is urged inwardly toward the patient to a position wherein said insert means will restrain movement of said member caused by said force applied by said support means.

6. A method of suspending a patient being treated by gravity lumbar reduction therapy, said method including the steps of encircling the rib cage and a portion of the torso therebelow of the patient, with a vest having a cushion insert extending inwardly toward the patient from a lower edge of the vest and having a cincture over the insert and positioning the vest along the patient's torso so that substantially the entire insert is disposed immediately below the lowermost rib of the patient and engages a bottom surface of the rib, securing the vest about the rib cage by tightening the cincture over the insert, suspensing the patient from a support structure with the head of the patient in an upward direction by suspensing the vest from the support structure wherein upward movement of the vest relative to the torso of the patient is restrained by said insert.

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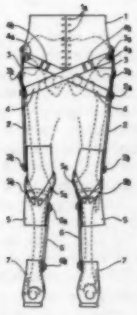
**4,422,453**

## EXTERNAL APPARATUS FOR VERTICAL STANCE AND WALKING FOR THOSE WITH HANDICAPPED MOTOR SYSTEMS OF THE LOWER LIMBS

**Guy J. Salort, 219, rue raymond Losserand, 75014 Paris, France**

**Filed May 26, 1982, Ser. No. 382,250**
**Claims priority, application European Pat. Off., Jun. 15, 1981, 8140049; France, Jun. 1, 1981, 81 10764**
**Int. Cl.³ A61F *5/04***
**U.S. Cl. 128—80 G** **14 Claims**



1. External apparatus for the vertical stance and walking for a person with handicap of the motor system of one or two lower limbs, comprising, in combination:

(a) a single piece corset disposed at the height of the pelvic girdle of the wearer;

(b) parallel to the side of the femur of the wearer and over its length, an outer femoral lever comprising a strip of flexible metal capable of absorbing and restoring the flexural and torsional stresses;

(c) at knee level of the wearer, a knee piece capable of maintaining the relative movements between the thigh and the leg in slight flexion and slight valgus position, within the strict limits of the physiological articular play;

(d) parallel to the antero-internal side of the tibia of the wearer and over its whole length, an antero-inner lever comprising a strip of flexible metal capable of absorbing and restoring the flexural and torsional stresses;

(e) a first elastic strap connecting the upper end of the outer femoral lever, substantially as an extension of the outer femoral lever, to the said corset in the vicinity of the iliac crest of the wearer;

(f) a second elastic strap extending transversely whilst sloping slightly upwardly connecting the outer femoral lever

to the corset towards or in the direction of the iliac spines of the wearer, the second elastic strap thus substantially crossing the pubic symphysis of the wearer;

(g) means connecting the lower end of the femoral lever to the knee piece;

(h) means connecting the upper end of the tibial lever to the knee piece; and

(i) means limiting the articular play of the tibio-tarsal articulation of the wearer, and connected to the lower end of the tibial lever.

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**4,422,454**

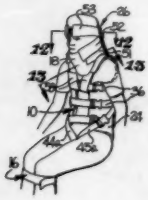
**EMERGENCY EXTRICATION APPLIANCE**

**Paul R. English, Charlotte, N.C., assignor to Medical Specialties, Inc., Charlotte, N.C.**

**Filed Jun. 7, 1982, Ser. No. 385,501**

**Int. Cl.³ A61G *1/00***

**U.S. Cl. 128—134** **25 Claims**



1. An emergency extrication appliance for the extraction of an injured person from an automobile or other confined location and where injury to the spine is suspected, and with the appliance being characterized by the ability of closely conform to the contour of the person during its application, and once applied, by the ability to effectively immobilize the full length of the spine and the head, and comprising,

a cervical collar adapted to encircle a wearer's neck to substantially immobilize the head and neck,

a relatively thin, generally flexible body support comprising a lower body portion adapted to overlie the lower back of the wearer, and a head support portion having a length and width sufficient to overlie the back of the neck and at least a portion of the head of the wearer,

an elongate semi-rapid reinforcing means mounted to said body support and extending medially along a lengthwise direction over at least a substantial portion of the length of said lower body portion and head support portion, to thereby overlie the spine of the wearer,

chest strap means mounted to said body support for encircling the wearer's chest and releasably securing the lower body portion to the back of the wearer, and

neck strap means for releasably interconnecting said head support portion of said body support and said cervical collar, and so as to substantially preclude relative movement therebetween upon being interconnected,

whereby in its operative position on the wearer, the appliance acts to rigidify substantially the entire length of the spine and the head of the wearer.

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**4,422,455**

**RESTRAINING DEVICE**

**Alan J. Olsen, Cordova, Tenn., assignor to Danek Medical, Inc., Cordova, Tenn.**

**Filed Aug. 4, 1981, Ser. No. 289,971**

**Int. Cl.³ A61F *13/00***

**U.S. Cl. 128—134** **14 Claims**

1. A device for restraining a patient to a certain rigid structure, said device comprising adjustable cuff means for bindable placement about an extremity of the patient, elongated strap means having a proximal end affixed to said cuff means and a distal end remotely situated therefrom, anchorable means for fixable attachment to said distal end of said strap means and to said certain rigid structure which may be inaccessible to the patient, and quick release means including separable cooperating receptacle and clasp members—one of which being affixed to said distal end of said elongated strap means with the other of said members being affixed to said anchorable means—for effectively facilitating expeditious release of said anchorable means from said distal end of said strap means to allow release of the patient when desired and for subsequently returning him to the original restraint condition with minimum effort, said

proximal end of said strap means being affixed to said cuff means, said adjustable cuff means includes first adjustable bindable means for facilitating an initial stabilizing condition of said cuff means about the extremity of the patient and second adjustable bindable means operable in conjunction with said first adjustable bindable means for subsequently facilitating optimum constraint of said cuff means about the extremity of the patient whereby said cuff means is prevented from tightening about the patient's extremity in the event the patient attempts to pull said distal end of said strap means from said anchorable means.

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**4,422,456**

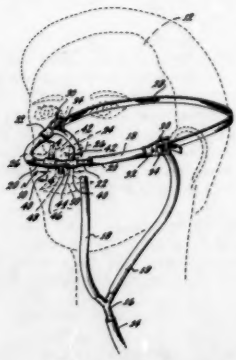
**NASAL CANNULA STRUCTURE**

**Brian L. Tiep, Monrovia, Calif., assignor to City of Hope National Medical Center, Duarte, Calif.**

**Filed Sep. 8, 1981, Ser. No. 299,873**

**Int. Cl.³ A61M *15/08***

**U.S. Cl. 128—207.18** **7 Claims**



1. A nasal cannula structure utilizing an elongated tubular conduit in which the improvement comprises:

support means for supporting said conduit so that a portion of said conduit extends beneath and adjacent to the nostrils of the nose of a user,

two separate, spaced holes located in said portion of said conduit said holes being separated from one another by an amount approximately corresponding to the spacing between the nostrils of the nose of a user,

two separate sleeves located around said portion of said conduit, each of said sleeves covering one of said holes,

a tube capable of fitting into a nostril of a user attached to each of said sleeves so as to extend outwardly from its, said sleeves each including means communicating with said tube so as to establish flow communication between said sleeve and said tube,

said sleeves fitting closely against the exterior of said conduit so as to prevent gas leakage between the exterior of said conduit and the interiors of said sleeves,

said sleeves also fitting against the exterior of said conduit in such a manner as to permit the relative locations of said sleeves with respect to said conduit to be adjusted so that said tubes fit within the nostrils of the nose of the user when said tubes are in communication with said holes.

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**4,422,457**

## SAFETY DEVICE FOR MEDICAL TREATMENT SYSTEM

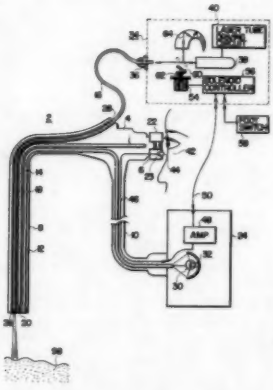
**Shinichiro Hattori, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Jul. 1, 1981, Ser. No. 279,327**

**Claims priority, application Japan, Jul. 14, 1980, 55-95872**

**Int. Cl.³ A61B** *17/36, 1/06*

**U.S. Cl. 128—303.1** **11 Claims**




1. A medical treatment system having a safety device, the medical treatment system comprising:

a medical optical apparatus having an eyepiece for observing an affected coeliac region of a patient requiring medical treatment;

medical treatment means for medically treating a specified spot of the affected coeliac region;

switch means coupled to said medical treatment means and being operable for selectively energizing said medical treatment means;

detection means for detecting the approach of an operator to said eyepiece, and for generating an output signal which is a function of a distance between the face of the operator and said eyepiece;

judgment means coupled to said detection means and responsive to the output signal of said detection means for judging when the operator is at or closer than a prescribed distance from said eyepiece and for generating a medical treatment-enabling signal when said operator is judged to be at or closer than said prescribed distance from said eyepiece; and

medical treatment-disabling means including means for normally maintaining said medical treatment means in a disabled state and for enabling energization of said medical treatment means by operation of said switch means only upon receipt of a medical treatment-enabling signal from said judgment means, whereby said medical treatment means cannot be energized by said switch means when said medical treatment-enabling signal is not generated.

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**4,422,458**

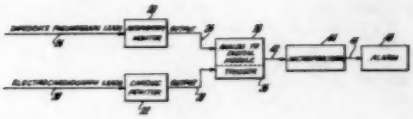
## METHOD AND APPARATUS FOR DETECTING RESPIRATORY DISTRESS

**Richard E. Kravath, Dobbs Ferry, N.Y., assignor to Montefiore Hospital and Medical Center, Inc., Bronx, N.Y.**

**Continuation-in-part of Ser. No. 144,272, Apr. 28, 1980, abandoned. This application Dec. 1, 1981, Ser. No. 326,176**

**Int. Cl.³ A61B** *5/04, 5/05, 5/08*

**U.S. Cl. 128—671** **14 Claims**



1. An apparatus for detecting a respiratory distress condition in a patient comprising:

first generating means connectable to a patient for providing a first electrical signal corresponding to thoracic cavity activity;

second generating means connectable to a patient for providing a second electrical signal corresponding to heart beat activity;

trigger means coupled to said second generating means for providing an electrical trigger pulse corresponding to each heart beat;

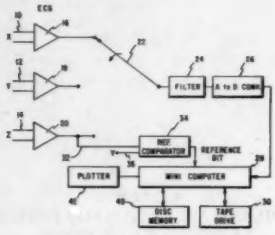
digitizing means coupled to said first generating means and said trigger means, said digitizing means being operative to produce a digital electrical pulse in response to each trigger pulse received from said trigger means, said digital electrical pulse corresponding to the amplitude of said first electrical signal of said first generating means; and

comparator means coupled to said digitizing means for comparing the amplitude of the most recent digital electrical pulse generated by said digitizing means to the amplitude of the previous digital electrical pulse, and for counting the number of consecutive digital electrical pulses having an amplitude equal to or greater than the amplitude of the preceding digital electrical pulse, said comparator means being operative to produce a third electrical signal when each of a selected number of consecutive digital electrical pulses has an amplitude greater than or equal to the digital electrical pulse immediately preceeding it, the selected number of digital electrical pulses defining the desired sensitivity of said apparatus and being at least ten pulses, said third electrical signal corresponding to a respiratory distress condition.

## 4,422,459
## ELECTROCARDIOGRAPHIC MEANS AND METHOD FOR DETECTING POTENTIAL VENTRICULAR TACHYCARDIA

Michael B. Simson, Cherry Hill, N.J., assignor to University Patents, Inc., Norwalk, Conn.

Continuation of Ser. No. 208,219, Nov. 18, 1980, abandoned.
This application Mar. 1, 1982, Ser. No. 353,538
Int. Cl.³ A61B 5/04
U.S. Cl. 128—702 16 Claims




1. A method for analyzing electrocardiograph signals to determine the presence or absence of a predetermined level of high frequency energy in the late QRS signal, comprising the steps of:

converting a series of QRS signals to time segments, each segment having a digital value equivalent to the analog value of said signals at said time;

applying a portion of said time segments in reverse time order to high pass filter means;

determining an arithmetic value of the amplitude of the output of said filter; and

comparing said value with said predetermined level.

## 4,422,460
## POSITIONABLE LOCATING AND ORIENTING WING FOR A PACING LEAD

Peter J. Pohndorf, Miami Shores, Fla., assignor to Cordis Corporation, Miami, Fla.

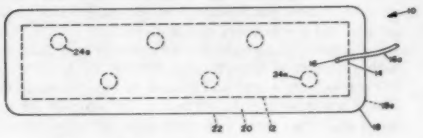
Filed Apr. 8, 1982, Ser. No. 366,816
Int. Cl.³ A61N 1/04
U.S. Cl. 128—786 11 Claims

1. In a pacing lead assembly comprising a flexible pacing lead including at least one insulated conductor having a proximal end and a distal end, means at the proximal end for electrically connecting the insulated conductor to a pulse generator, a flexible bent or curved configuration in an outer end portion of the lead adjacent the distal end of the lead and an electrode assembly including at least one electrode mounted at the distal end of the pacing lead, the at least one electrode being connected to the conductor, the improvement comprising a positionable, locating, orienting and stabilizing device mounted on the pacing lead and having a passageway through which the pacing lead is received such that said device can be rotated on the pacing lead and cooperating locking means fixed on the lead and adapted to mate and lock with said device in a predetermined position of said device, whereby said device when locked in place in said predetermined position on the lead, has a predetermined orientation relative to the bent or curved configuration in the outer end portion of the pacing lead and whereby said device in its unlocked position can be rotated to a non-obtrusive position relative to the outer end portion of the pacing lead, said device being generally flat and planar in shape and said unobtrusive position being a position where the plane of said flat planar device is generally coplanar with the plane of the bent or curved configuration in the outer end portion of the pacing lead, whereby the pacing lead assembly can be packaged in a flat or flush position on a substrate.

## 4,422,461
## ELECTRODE

George Glumac, RR 2, Box 252G, Conifer, Colo. 80433

Filed Aug. 12, 1981, Ser. No. 292,218
Int. Cl.³ A61N 1/04
U.S. Cl. 128—798 18 Claims



1. Electrode comprising:

a. a layer of high-impedance carbon-loaded polycarbonate film material of a thickness of 0.1–5 mils;

b. a metalized layer of low-impedance metallic foil material vapor desposited over said film material in a like geometrical configuration as said film material;

c. a layer of plastic covering material with adhesive securing means disposed on a side of said foil material opposite said film material, said plastic covering material slightly larger than said film material and said foil material, and said securing means joining said film material, said foil material, and said plastic covering material together;

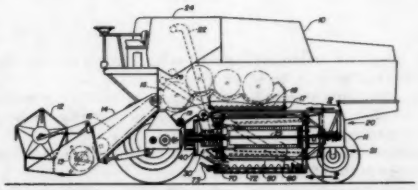
d. a conductive medium layer disposed on a side of said film material opposite said foil material and substantially covering said film material; and,

e. snap means for electrically connecting to said electrode in electrical and mechanical connection to said foil material whereby said electrode maintains maximum flexibility and minimum profile over skin of an individual.

## 4,422,462
## DRIVE MECHANISM FOR ROTARY CLEANING DEVICE

Frans J. G. C. Decoene, Zedelgem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Aug. 17, 1982, Ser. No. 408,981
Int. Cl.³ A01F 12/00
U.S. Cl. 130—27 AA 20 Claims



1. In a rotary cleaning mechanism for cleaning threshold grain in a combine harvester, said cleaning mechanism having a frame; a cleaning cylinder rotatably mounted on said frame about an axis of rotation extending in a fore-and-aft direction; a rotatable infeed mechanism mounted on said frame forwardly of said cleaning cylinder; a fan rotatably supported by said frame proximate to said cleaning cylinder; and drive means for rotatably powering said cleaning cylinder, said infeed mechanism and said fan, said drive means being operatively connected to a drive transfer means for transferring rotational

power from a prime mover, an improved drive means comprising:

a composite drive shaft defining said axis of rotation, said cleaning cylinder, said infeed mechanism and said fan being rotatable about said axis of rotation, said composite drive shaft including a first shaft member rotatably supported by said frame and having a tubular portion forming the inwardmost end thereof and a second shaft member rotatably supported by said frame and rotatably received within said tubular portion of said first shaft member;

a first pulley connected to said first shaft member in operative communication with said drive transfer means to drivingly rotate said first shaft member;

a second pulley rotatably mounted on said first shaft member in operative communication with said drive transfer means for rotation independently of said first shaft member;

a third pulley connected to said second shaft member in operative communication with said drive transfer means to drivingly rotate said second shaft member; and

a fourth pulley rotatably mounted on said second shaft member in operative communication with said drive transfer means for rotation independently of said second shaft member.

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**4,422,463**

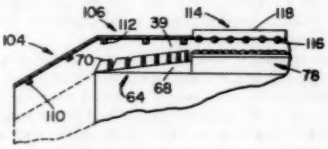
## ROTOR FOR AN AXIAL FLOW ROTARY SEPARATOR

**Neil L. West, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.**

**Division of Ser. No. 889,626, Mar. 24, 1978, Pat. No. 4,178,943. This application Jul. 2, 1979, Ser. No. 53,665**

**Int. Cl.³ A01F** *12/22, 7/06*

**U.S. Cl. 130—27 HA** **5 Claims**




1. In an axial flow rotary separator for threshing and separating grain crop material and the like having a housing within which a rotor rotates and an axially extending annular space between rotor and housing in which through co-action between rotor and housing crop material is propelled spirally downstream while being threshed and separated, said separator having an upstream feed portion including a housing feed portion for receiving harvested crop material and conveying it downstream and a threshing portion including a housing threshing portion and a rotor threshing portion having a plurality of circumferentially spaced threshing bars, a separator transition portion extending between the separator feed and threshing portions for conveying crop material from the feed to the threshing portions comprising:

a housing transition portion communicating with the housing feed portions and the housing threshing portions at its upstream and downstream ends respectively;

a rotor transition portion rotatably mounted in the housing transition portion including an elongated ramp-style rasp bar substantially spanning the axial extent of the rotor transition portion and including a plurality of spaced side-by-side first raised rib-like elements, said bar being disposed so that radial clearance between the housing transition portion and the rib-like elements decreases progressively in a downstream direction; and

means for propelling material downstream carried by the rotor transition portion, including an array of axially spaced material control elements substantially spanning the axial extent of the transition portion and, in large part, circumferentially spaced from the ramp-style rasp bar said elements being disposed so that towards the upstream end of the transition portion the radial clearance between the elements and the housing is less than the corresponding clearance of the circumferentially corresponding elements of the ramp-style rasp bar.

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**4,422,464**

## APPARATUS FOR THE FORMING OF HAIR

**Bertil Josefsson, Kageröd, Sweden, assignor to NPI New Products Investment AB, Askim, Sweden**

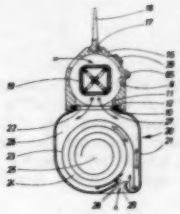
**PCT No. PCT/SE80/00196, § 371 Date Mar. 27, 1981, § 102(e) Date Mar. 27, 1981, PCT Pub. No. WO81/00347, PCT Pub. Date Feb. 19, 1981**

**PCT Filed Jul. 30, 1980, Ser. No. 248,569**

**Claims priority, application Sweden, Jul. 30, 1979, 7906447**

**Int. Cl.³ A45D** *20/00*

**U.S. Cl. 132—9** **5 Claims**



1. Apparatus for forming hair, comprising: a hair forming tool provided with a casing having a first opening, at least one first duct in said casing and a first chamber communicating with said first duct, a suction device for creating an underpressure in said first duct and communicating with said first duct through said first chamber, said first opening serving for the introduction of a strand of hair into said first duct and into said first chamber, a second chamber surrounding said first chamber and forming part of at least one second duct communicating with ambient air, heating means in said second duct, said second duct having a second opening adjacent said first opening for passage of air from said heating means through said second duct into said first chamber, said second chamber via said second opening surrounding said first opening having a first connection with the first duct, and also having a second connection with the second duct for the supply of air, so that when there is an underpressure in said first duct, air rushes in via said first opening and via said first connection partly directly from the ambient air and partly from said second chamber and through said first duct to said first chamber, and timing means connected to said heating means for keeping the same in operation for a first predetermined period of time and for discontinuing operation for a second predetermined period of time, and also connected to said suction device for keeping the same in operation even when said heating means is inoperative.

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**4,422,465**

## NAIL FILE AND METHOD FOR PRODUCING THE SAME

**Tomoyuki Haga, Tokyo, Japan, assignor to Shiseido Company, Ltd., Tokyo, Japan**

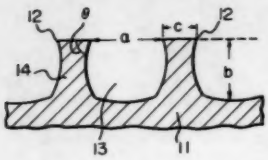
**Filed Oct. 17, 1980, Ser. No. 198,230**

**Int. Cl.³ A45D** *29/04*

**U.S. Cl. 132—76.4** **2 Claims**

1. A nail file having a number of file blades formed by a number of edge lines or concave portions, which are etched in the surface of flat metal plate, the arrangement of said concave portions being random or irregular, the diameter a of said concave portions being within the range of 100 to 300 microns,

the depth b of said concave portions being within the range of 10 to 60 microns, the distance c between the adjacent edge




lines of said concave portions being within the range of 10 to 60 microns and the angle $\theta$ of the blades being less than 90°.

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**4,422,466**

**ARRANGEMENT FOR CLEANING CONTAINERS OF DIVERSE SHAPES**

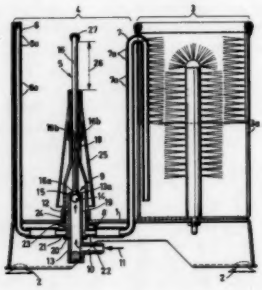
**Klaus Schäfer, Wuppertal, Fed. Rep. of Germany, assignor to Schicker & Schäfer, Wuppertal, Fed. Rep. of Germany**

**Filed Apr. 30, 1982, Ser. No. 374,608**

**Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131333**

**Int. Cl.³ B08B *3/02, 9/08***

**U.S. Cl. 134—55** **14 Claims**



**1. An arrangement for cleaning containers, especially drinking utensils of diverse shapes, such as tumblers and stemware, comprising a support; means for spraying cleaning liquid on the internal surface of the respective container assuming a predetermined position relative to said support, including an elongated spraying assembly mounted on said support and having an internal distributing passage spaced in a predetermined direction from said support, and means for controlledly admitting the cleaning liquid at a predetermined pressure into said distributing passage, including a valve seat situated within said spraying assembly immediately upstream of said distributing passage, and a valve member movable toward and away from said valve seat; and means for directing a plurality of jets of the cleaning liquid against the external surface of the container assuming its predetermined relative position, including at least one tubular element extending substantially parallel to said direction at a transverse spacing from said spraying assembly and having a plurality of jet openings aimed toward said spraying assembly, and means for conducting a portion of the cleaning liquid from said distributing passage substantially oppositely to said direction to an upstream portion of said tubular element.**

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**4,422,467**

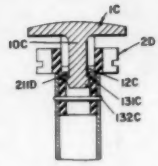
**COUPLING STRUCTURE OF THE UPPER NOTCH AND FERRULE ON AN UMBRELLA OR PARASOL**

**Tsun Z. Wu, No. 15, Lane 52, Ho-Ping West Rd., Section 3, Taipei, Taiwan**

**Filed Apr. 26, 1982, Ser. No. 371,828**

**Int. Cl.³ A45B *25/10***

**U.S. Cl. 135—36 TP** **5 Claims**




**1. A coupling structure for connecting a ferrule to a notch member of an umbrella comprising:**

**said notch member having an opening therein;**

**a projection extending from said ferrule engaged in said opening;**

**first means defining a stepped diameter area on one of said opening and projection; and**

**second means defining a radially extending ring part on the other of said opening and projection engaged in said stepped diameter area;**

**said notch member being made of flexible material and being integrally formed with said radially extending ring part;**

**said projection including an upper portion having a diameter substantially corresponding to a diameter of said opening and a lower portion, said first means comprising a small diameter portion between said upper and lower portions of said projection;**

**said opening of said notch member having a large diameter upper part for engagement with said upper part of said projection and a smaller diameter lower part for engagement with said lower part of said projection, said radially extending ring part having an axially extending portion extending upwardly from said small diameter portion of said opening with a space defined between a radially outer end of said radially extending ring part and an inner surface of said large diameter portion of said opening, whereby said projection of said ferrule can be inserted into said opening to resiliently move said radially extending ring part first outwardly then, with said ferrule coupled to said notch member, said radially extending ring part moves radially inwardly into said small diameter portion through the resiliency of said radially extending ring part.**

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**4,422,468**

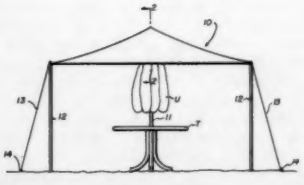
**CANOPY FOR USE WITH AN UMBRELLA**

**George W. Wilson, 5042 13th St., NE., Washington, D.C. 20017**

**Filed Feb. 24, 1982, Ser. No. 351,903**

**Int. Cl.³ E04F *10/00***

**U.S. Cl. 135—97** **5 Claims**



**1. A canopy comprising in combination:**

an umbrella having a lower support stand, a pole and an upper fabric covering,

a tarp having a surface area substantially greater than the fabric covering,

means connecting said tarp to the umbrella,

and means holding said tarp along its edges in an elevated position,

whereby said canopy serves as an adjunct to the umbrella, protecting a comparatively greater area from weather wherein said holding means comprises in combination, peripherally disposed grommets in said tarp, canopy poles with stepped down protrusions at an upper extremity to engage said grommets, and ropes with pegs extending from said protrusions to the ground to provide support for said tarp wherein said connecting means comprises a pole cap including a hollow, cylindrical upper collar with an inwardly extending, horizontal stop lip at an upper extremity and threads disposed on an inner sidewall thereof, a hollow, cylindrical lower collar with an outwardly extending horizontal lip at a lower extremity thereof and a bevelled surface opposing said lip further including threads on an outer sidewall thereof for threaded engagement with said upper collar with said tarp captured therebetween, said upper collar and said lower collar defining a central bore in said canopy to engage the pole of the umbrella.

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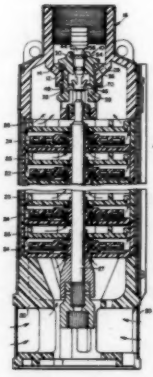
**4,422,469**

## SUBMERSIBLE PUMP CHECK VALVE

**Nyle D. LaGrange, Bettendorf, and Elmer M. Deters, Muscatine, both of Iowa, assignors to The Marley/Wylain Company, Mission, Kans.**

**Filed Aug. 12, 1981, Ser. No. 292,049**
**Int. Cl.³ F16K *15/02***
**U.S. Cl. 137—315** **8 Claims**



1. A check valve comprising:

a casing having walls defining a fluid passageway and a pair of openings respectively located on opposite ends of said passageway and in communication therewith;

check valve means operably located in said passageway and shiftable between a flow and a non-flow position for permitting fluid flow in one direction through said passageway with said valve means in said flow position and for normally preventing fluid flow through said passageway in a second direction opposite said one direction with said valve means in said non-flow position, said valve means including

a body member having structure defining a bore therethrough;

a plurality of elongated, yieldable, resilient legs having engagement means and coupled to said body, said legs being shiftable from a radially-outward position for preventing removal of said check valve means from said passageway to a radially-inward position for permitting removal of said valve means from said passageway; and

an elongated stem normally disposed through said body member bore and having locking means adjacent one end, said stem being axially shiftable for permitting said locking means to engage said legs into said radially-outward position and for permitting said locking means to disengage from said legs for allowing said legs to yield into said radially-inward position.

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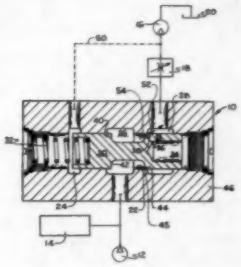
**4,422,470**

## FLOW LIMITING VALVE

**Alan D. Jackson, and Dennis J. Stucky, both of Hutchinson, Kans., assignors to The Cessna Aircraft Company, Wichita, Kans.**

**Filed Jul. 1, 1982, Ser. No. 394,381**
**Int. Cl.³ F16K *17/34***
**U.S. Cl. 137—484.2** **7 Claims**



1. In a control valve having a valve spool which is positioned by varying axial forces thereon; the spool having alternately spaced grooves and lands, and a conventional valve body having a bore in which the spool is slidable from a closed position to at least one metering position providing restricted flow from a pressurized cavity in the body across a notch to an exhaust cavity in the body and at least one servo chamber acting on an end surface of the spool for positioning the spool, the improvement comprising:

a metering land on the valve spool;

at least one metering notch positioned between the metering land and the valve bore;

a vent passage means in the metering land connected to the servo chamber and positioned downstream of one of the metering notches and substantially axially aligned with said notch whereby the fluid jet exiting the notch has a tendency to pull fluid from the vent passage and decrease the pressure in the servo chamber whereby certain forces on the spool when in a fluid dynamic state can be cancelled so that the control valve will be unaffected by changing flows through the valve and varying pressure drops across the valve.

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**4,422,471**

## FOUR BAR MANIFOLD

**Ernest C. Faccini, Marbury, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed May 24, 1982, Ser. No. 381,829**
**Int. Cl.³ B63K *7/00***
**U.S. Cl. 137—561 A** **2 Claims**

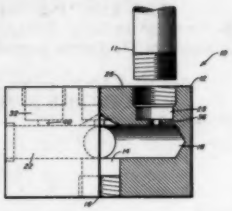
1. A manifold for uniformly and equally distributing gas to each of a plurality of burn bar torches for burning holes in objects comprising:

a body member having at least one face, said body member further including;

a central plenum chamber having an inlet for receiving the gas,

a plurality of equally spaced radially extending cross passages, each of said passages having one end connected to said plenum chamber for carrying the gas out of said plenum chamber,

a plurality of orifices, each of said orifices having an inlet end connected to one of said respective cross passages and extending from said cross passage in perpendicular relation to said body face for receiving the flow of gas



from said cross passage, said orifices adapted to maintain sonic gas flow therethrough,

a plurality of outlet chambers, each of said outlet chambers having an inlet end connected in co-axial relationship to one of said respective orifices and extending perpendicularly to said face for receiving the flow of gas from said orifices and for distributing the gas to the burn bar torches, said outlet chambers adapted to receive the burn bar torches whereby,

the flow of gas is distributed uniformly and equally to each of the burn bar torches and the burn bar torches burn holes of equal size in the object.

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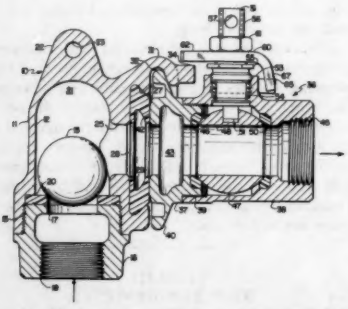
**4,422,472**

## PUMP BASIN VALVE AND SLIP JOINT

**L. E. Klein, Mansfield, Ohio, assignor to Harvey Hubbell Incorporated, Orange, Conn.**

**Filed Oct. 29, 1981, Ser. No. 316,148**
**Int. Cl.³ F16L *37/00***
**U.S. Cl. 137—614.06** **4 Claims**



1. A valve and coupling apparatus for releasably interconnecting the outlet of pump and a conduit comprising

a first valve assembly comprising

a first housing;

means defining a passage through said first housing, at least one end of said passage terminating in an opening having a generally horizontal axis, the other end of said housing being connectable to the pump outlet,

a check valve in said housing, and

a generally U-shaped flange on said housing opening downwardly and partially encompassing said opening, said flange having a continuous recess extending along the inwardly facing surface thereof;

a second valve assembly comprising

means defining a flow path therethrough, at least one end of said flow path terminating in an opening having a generally horizontal axis and the other end thereof being connectable to the conduit,

a radially outwardly extending, generally circular flange surrounding said opening, said circular flange being shaped and dimensioned to be received in said recess in said U-shaped flange downwardly over said circular flange, thereby coupling said first and second housings together with said

at least one openings aligned,

a valve element in said flow path, said valve element being rotatable through an angle of about 90° between positions in which said flow path is opened and closed,

a stem attached to and rotatable with said valve element and extending upwardly through said second housing, the exposed end thereof being connectable to a handle, and

a locking tab coupled to said stem and having an end portion extending radially away from said stem, said tab being oriented toward said first housing when said valve element is in the open position; and

said first housing further comprises

a projection fixedly attached to said first housing and extending toward said stem when said first and second housings are coupled together and protruding between said second housing and said tab when said valve element is in its open position, thereby preventing uncoupling of said housings until said valve element is rotated to its closed position.

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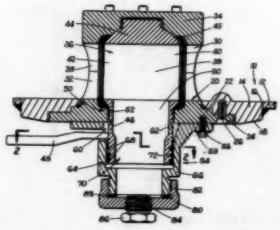
**4,422,473**

## TANK BALL VALVE HAVING DEPENDING SLEEVE AND HANDLE ATTACHED TO THE SLEEVE

**Richard B. Polley, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.**

**Filed Sep. 4, 1981, Ser. No. 299,364**
**Int. Cl.³ F16K *51/00***
**U.S. Cl. 137—625.32** **15 Claims**



1. A ball valve assembly comprising: a ball valve housing adapted to be mounted within a tank inlet including a hollow body portion having at least one inlet port; a ball valve located within said housing and including a valve body portion which in one position is adapted to close said housing port; said ball valve including a ball valve port adapted to align with said housing port to allow lading to enter said ball valve; said ball valve further including a depending hollow sleeve extending below said tank; an outlet chamber provided around said sleeve; operating handle means connected to said sleeve below said tank to move said ball valve between open and closed position; said outlet chamber being connected to said ball valve housing with shearable fasteners which define a shear plane, and said sleeve including shear means aligned with said shear-

able fasteners whereby upon hard impact said outlet chamber and a portion of said sleeve will shear off leaving said ball valve in place within said housing.

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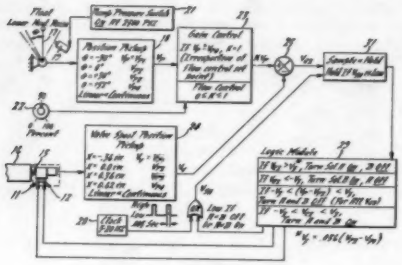
**4,422,474**

## ELECTRO-HYDRAULIC REMOTE VALVE

**Habil S. Basrai, Port Huron, Mich., and Ganesh Rajagopal, Richardson, Tex., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Sep. 14, 1981, Ser. No. 301,789**
**Int. Cl.³ F15B *13/043***
**U.S. Cl. 137—625.64** **6 Claims**



1. An electrical control system for a hydraulic power system that includes a source of pressurized fluid and a hydraulic remote valve means for directing the application of the pressurized fluid to move an implement in selective directions, the remote valve means including a linearly movable actuating portion;

the electrical control system comprising:

an electro-hydraulic actuator connected to the pressurized fluid source having an operating member coupled to the remote valve means actuating portion;

the actuator including a flow control valve connected to an adjustable flow rate control means for setting the flow rate of the pressurized fluid to the hydraulic remote valve;

a control handle having multi-detent positions;

and a feedback electronic control circuit that translates the position of the control handle into a position of the actuating portion of the hydraulic remote valve;

the feedback electronic control circuit including a control handle position transducer that produces a handle position indicating output signal;

a gain control circuit into which the output signal is fed to attenuate the same in proportion to the flow rate setting of the adjustable flow rate control means;

a position transducer means coupled to the operating member of the electro-hydraulic actuator for generating a signal sensing the actual position of the operating member;

a differential summing device having as its inputs the output signal of the gain control circuit and of the electro-hydraulic actuator operating member position sensing signal and as its output an error signal representing the difference between the actual and desired positions of the implement;

a sample-and-hold circuit having an input to receive the error signal;

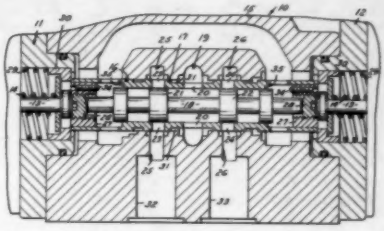
and a clock logic means for transmitting the error signal at predetermined time intervals from the sample-and-hold circuit to the electro-hydraulic actuator to activate the latter to operate the hydraulic remote valve to cause the implement to move in raising or lowering direction or to hold the implement against movement.

**4,422,475**

## VARIABLE GAIN SERVO CONTROLLED DIRECTIONAL VALVE

**Ronald A. Aspinwall, Detroit, Mich., assignor to Vickers, Incorporated, Troy, Mich.**

**Filed May 29, 1981, Ser. No. 268,489**
**Int. Cl.³ F15B *13/044***
**U.S. Cl. 137—630.15** **27 Claims**



1. A variable gain servo controlled directional valve comprising

a valve body having an elongated bore,

a sleeve in said bore,

a spool mounted for reciprocating movement in said sleeve,

a force motor for positioning said spool in said sleeve,

said valve body having an inlet pressure port and outlet pressure ports,

said sleeve having passages permitting flow from said pressure ports to the interior of said sleeve,

said spool controlling the flow through the sleeve and movable from a null position to selective positions permitting fluid flow to said outlets of said body,

said sleeve including a bypass channel whereby upon shifting movement of said sleeve relative to said body, said bypass channel will permit fluid flow from said inlet port in said body to one of the outlet ports,

and means operable upon movement of said force motor to selectively control movement of said sleeve and said spool,

said last-mentioned means being operable upon shifting of said spool to initially permit flow under the control of said spool to one of said outlets in said body and upon continued movement of said spool to cause said sleeve to be moved axially so additional fluid will flow from said inlet port in said body to the selected outlet port of said body, and includes means for adjustably controlling the point in the axial movement of said spool when the axial movement of said sleeve is initiated.

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**4,422,476**

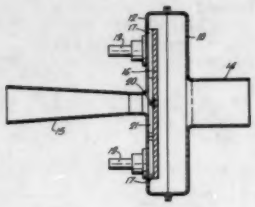
## FLUIDIC CONTROL DEVICES

**Alan Blanchard, Preston, England, assignor to United Kingdom Atomic Energy Authority, London, England**

**Filed Mar. 10, 1983, Ser. No. 474,147**
**Claims priority, application United Kingdom, Mar. 16, 1982, 8207670**
**Int. Cl.³ F15C *1//16***
**U.S. Cl. 137—810** **5 Claims**

1. A fluidic control device, in particular a vortex amplifier, comprising a casing, a supply fluid inlet communicating with the interior of the casing through a central opening in one end wall of the casing, a fluid outlet shaped as a diffuser communicating with the interior of the casing through a central opening in the opposite end wall of the casing, a plate within the casing and cooperating with the opposite end wall to form a vortex chamber, at least one further inlet for a control fluid in a wall of the casing, a spacer member defining a part of the periphery of the vortex chamber and disposed between the plate and the opposite end wall of the casing, a channel in the member com-

municating with the further inlet for directing control fluid into the vortex chamber, and in which characterised in that an



aperture is formed in the plate adjacent the channel in the member whereby to divert a portion of the control fluid to the side of the plate facing the supply fluid inlet.

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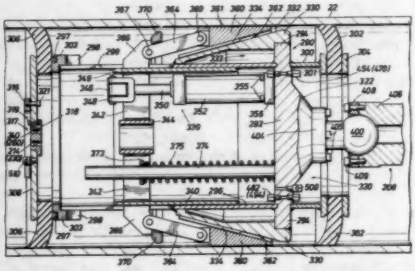
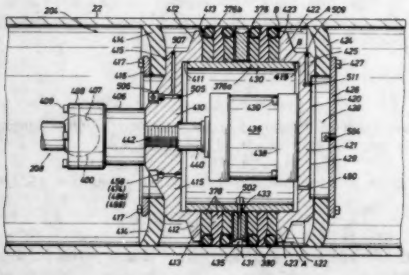
**4,422,477**

## PRESSURE ENERGIZED PIPELINE PLUG

**Robert H. Wittman; David E. Adkins, and Ronnie E. Haws, all of Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.**

**Filed Feb. 27, 1981, Ser. No. 238,713**
**Int. Cl.³ F16L 55/10**
**U.S. Cl. 138—89** **14 Claims**





1. Apparatus for plugging the bore of a pipe at a selected location and withstanding a pressure differential thereacross that may equal or exceed the designed working fluid pressure of the pipe, comprising in combination:

cylindrical body means adapted for insertion into the pipe bore and for axial movement therein, said body means including a pressure head having a selected area;

support means attached to and cooperating with said body means for supporting said body means axially in the pipe during movement therein;

pipe gripping means carried by said body means for locking engagement with the inside surface of the pipe to anchor said body means in said pipe;

compression seal means having a selected annular area and carried by said body means for radially expanding in response to axial force applied thereto for sealingly engaging the inside surface of the pipe and converting said axial force into radial sealing pressure in a predetermined relationship;

an actuating sleeve adapted for limited axial sliding movement within said cylindrical body means; and

force applying means mounted within said body means for applying a predetermined axial force to said actuating sleeve to move said sleeve axially within said body means;

said actuating sleeve cooperating with pipe gripping means for driving said pipe gripping means into locking engagement with the pipe in response to said axial force applied thereto by said force applying means.

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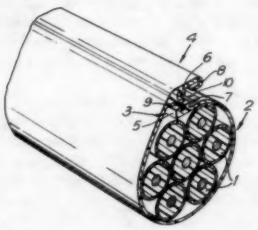
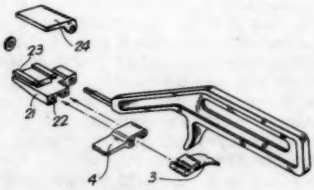
**4,422,478**

## CLOSURE DEVICE

**Harry Pentney, Highworth, and Anthony R. L. Fitch, Swindon, both of United Kingdom, assignors to Raychem Limited, London, England**

**Filed Feb. 10, 1981, Ser. No. 233,119**
**Claims priority, application United Kingdom, Feb. 23, 1980, 8006212; Nov. 10, 1980, 8036170**
**Int. Cl.³ F16L 11/12**
**U.S. Cl. 138—168** **10 Claims**





1. A wraparound device, comprising:

a cover having an underlying edge and an overlying edge, the edges being opposed, the underlying edge having a first edge portion and the overlying edge having a second edge portion, the edge portions being interlocked;

the first edge portion having a first ridge and said second edge portion having an opposed second ridge for engagement of the edge portions, the first and second ridge having a height which is approximately equal to one another;

the first edge portion having a protuberance extending along the first edge portion and spaced from the first ridge a distance greater than the width of the second ridge the protuberance defining a flange extending longitudinally

along the first edge portion and in a direction away from the second edge portion and substantially parallel to the cover defining a width, the width of the flange being at least twice the height of the ridges;

the second edge portion having a longitudinally extending portion defining a flap and a further proterberance which abuts and underlines only the first ridge longitudinally along the first edge portion, the flap has a terminus defining a curved rim for gripping the flange;

upon engagement of the edges, the flap overlies the flange with the curved rim gripping the underside of the flange at a distance from the first ridge at least twice the height of the ridges; and

thereby, upon application of a tensile force tending to open the cover after engagement, the ridges absorb the majority of such a force, thereby reducing the opening force experienced by the flap against the flange and reducing the likelihood of the cover opening after engagement.

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**4,422,479**

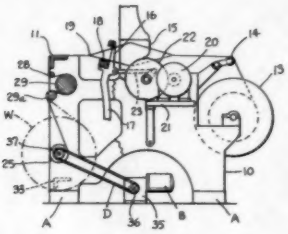
## LOOM CLOTH TAKE-UP AND METHOD

**William J. Alexander, III, P.O. Box 848, Mauldin, S.C. 29662**

**Filed Aug. 6, 1981, Ser. No. 290,732**

**Int. Cl.³ D03D *49/00, 49/20***

**U.S. Cl. 139—1 R** **1 Claim**



1. A method of enlarging the cloth take-up capacity of a loom having a center wind take-up roll carried by a front frame portion of the loom comprising the steps of:

raising and supporting the loom in raised position;

removing transverse obstructing loom members to permit increased size capacity for a wound roll of cloth accommodated by the raising of the loom;

positioning the take-up roll on the loom between the side frame members so that a major portion of the take-up roll is carried within the side frame members;

driving the take-up roll independently of other loom driving mechanism through a non-slip driver to center wind cloth produce by the loom; and

controlling the driving of the take-up responsive to tension in the cloth by limiting current to a D.C. motor driving the take-up roll.

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**4,422,480**

## LOOM-HEDDLE SELECTOR

**Werner Geirhos, Senden, and Josef Dietmayer, Bibertal, both of Fed. Rep. of Germany, assignors to Grosse Webereimaschinen GmbH, Neu-Ulm, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 153,821, May 27, 1980. This application Feb. 24, 1982, Ser. No. 351,994**

**Claims priority, application Fed. Rep. of Germany, May 31, 1979, 2922318**

**Int. Cl.³ D03C *1/00***

**U.S. Cl. 139—66 R** **10 Claims**

1. An apparatus for operating a loom heddle, said apparatus comprising:

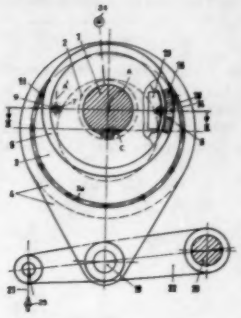
a drive shaft centered on and defining an axis;

means for rotating said drive shaft about said axis;

an eccentric carried on said drive shaft, rotatable relative thereto about said axis, and formed with an axially extending guide;

crank means connecting said eccentric to said heddle for displacement of said heddle between end heddle positions as said eccentric rotates about said axis;

a drive disk rotationally fixed on said drive shaft adjacent said eccentric and formed with at least one recess axially alignable with said guide;



an entrainment bolt axially displaceable in said guide between an extended entrainment position projecting axially in one direction therefrom into said recess of said drive disk and thereby rotationally coupling said drive disk and eccentric together and a retracted position disengaged from said recess for relative rotation of said drive disk and eccentric; and

means including a switch element operatively engageable with said bolt to displace same axially between said positions.

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**4,422,481**

## ADJUSTABLE FASTENER FOR FASTENING PULLING CABLES ON THE SUSPENSION LEVERS OF TEXTILE DOBBIES OF THE NEGATIVE TYPE

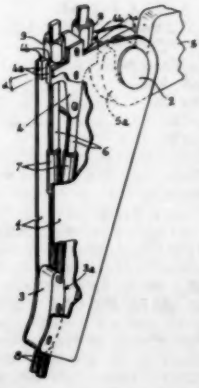
**Joseph Palau, Duingt, France, assignor to S.A. Des Etablissements Staubli, Faverges, France**

**Filed Jan. 18, 1982, Ser. No. 340,178**

**Claims priority, application France, Jan. 30, 1981, 81 01980**

**Int. Cl.³ D03C *13/00***

**U.S. Cl. 139—88** **3 Claims**



1. An adjustable fastener for fastening pulling cable means to

the suspension levers of textile dobbies of the negative type, wherein said fastener comprises two parallel side elements between which are mounted a transverse pin adapted to cooperate with the end of a suspension lever, a lower guide of curved section forming support for said cable means, and an upper stop comprising forked arm means oriented in the mean plane of the side elements so as to constitute a support for adjusting and locking nut means screwed on the upper ends of corresponding end piece means fixed to the cable means and passing through the said forked arm means.

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4,422,482

## GUIDE TOOTH FOR A WEAVING MACHINE

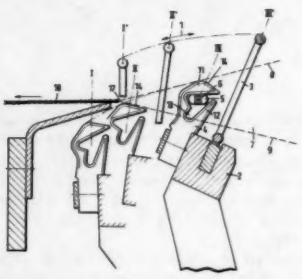
Otto Hintsch, Wallisellen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 18, 1981, Ser. No. 322,584

Claims priority, application Switzerland, Dec. 2, 1980, 8886/80

Int. Cl.³ D03D *49/60*

U.S. Cl. 139—188 R 5 Claims



1. In a weaving machine having means for forming a shed of air tangled warp threads between a low shed position and a high shed position,

a sley having a plurality of guide teeth for defining a weft path through said shed, each said tooth having a free upper leg with a straight outside edge for entering into said shed between two of the warp threads in said low shed position, said edge being parallel to the warp threads in said low shed position at a point adjacent said low shed position whereby upon entry into said shed the threads of said low shed position are not split by said teeth.

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4,422,483

## ANTISTATIC FABRIC AND GARMENT MADE THEREFROM

Howard M. Zins, Manchester, Mo., assignor to Angelica Corporation, St. Louis, Mo.

Filed Jun. 3, 1981, Ser. No. 269,910

Int. Cl.³ D03D *15/00*; A41B *0/00*; B32B *9/00*

U.S. Cl. 139—420 R 4 Claims

1. A woven fabric which substantially prevents the passage therethrough of hair and flaked-off particles of skin and which is readily laundered and which exhibits a charge decay of ninety percent from an applied voltage of five thousand volts within one-half of a second and which limits the average electrostatic charge that can be measured on said fabric to less than one hundred volts, even after many launderings, and hence is usable in making garments for "clean rooms" wherein static-sensitive devices are handled, and which comprises a first plurality of threads and a second plurality of threads, the threads of said first plurality of threads being essentially parallel to each other and extending in one direction, the threads of said second plurality of threads extending transversely of said one direction, one of said plurality of threads having the major portion thereof constituted by threads that are electrically resistive and having the minor portions thereof constituted by threads that are electrically conductive, each of said electrically-resistive threads of said one plurality of threads comprising a multiplicity of non-textured, continuous, non-conductive filaments, each of said electrically-conductive threads of said one plurality of threads being a plural-ply thread, at least one ply of each of said electrically-conductive threads of said one plurality of threads being non-textured and continuous and having a denier of at least fifteen (15) and having conductive material at the surface thereof to render said one ply especially adapted to conduct static electricity, at least one other ply of each of said electrically-conductive threads of said one plurality of threads including non-textured, continuous non-conductive filaments to help make said electrically-conductive threads resistant to breaking, whereby said electrically-conductive threads can be woven into said fabric on commercial looms on a commercial scale and can remain substantially intact despite fifty commercial launderings, said conductive material at said surface of said one ply of each of said electrically-conductive

threads of said one plurality of threads providing an essentially-continuous and essentially-uninterrupted electrically-conductive path through the entire length thereof, said one ply of each of said electrically-conductive threads of said one plurality of threads being an identifiable ply of a diameter larger than each of said non-conductive filaments and that has the configuration of an open-type helix and that has a very substantial portion of the surface thereof exposed at the surface of said electrically-conductive thread, whereby the conductive surface of said one ply of each of said electrically-conductive threads of said one plurality of threads constitutes an exposed and visible part of the surface of said electrically-conductive thread, and whereby said conductive surfaces of said one ply coact to help provide said charge decay of ninety percent from an applied voltage of five thousand volts within one-half of a second and also to help limit the average electrostatic charge that can be measured on said fabric to less than one hundred volts.

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4,422,484

## WEFT GUIDE DEVICE IN A JET LOOM

Hiroshi Arakawa, Kariya, and Kinpei Mitsuya, Aichi, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Nov. 24, 1981, Ser. No. 324,609

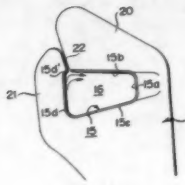
Claims priority, application Japan, Nov. 28, 1980, 55-168652

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—435 3 Claims

1. A weft guide device in a jet loom having a reed carrier for carrying a reed thereon, said device comprising an array of substantially vertically disposed and adjacently aligned weft

guide members mounted on said reed carrier along the reed, each of said weft guide members having substantially conjoining and straight upper wall, fore wall, lower wall and rear wall surfaces providing a generally quadrilateral-shaped weft guide opening which, together with said weft guide openings of said other aligned weft guide members, provides a weft guide path, said rear wall surface and said upper wall surface of each of said weft guide members being spaced apart to provide a relatively narrow weft thread opening therebetween to allow a weft thread to move therethrough out of said guide path in




preparation for the beating by said reed, and an air discharge member disposed substantially within said guide member array and laterally adjacent to one of said weft guide member rear wall surfaces to discharge air obliquely into said weft guide path and towards said fore wall surfaces, said rear wall surface of each said weft guide member being substantially vertical and having a curved upper portion adjacent to said weft thread opening to direct upwardly moving air currents along said rear wall surface across said weft thread openings and said upper wall surfaces of the weft guide members.

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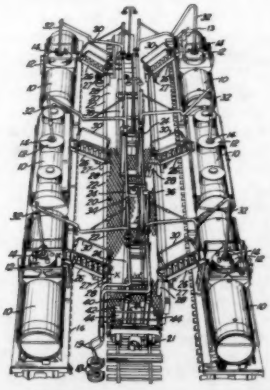
**4,422,485**

## INTEGRATED MOBILE TANK-SERVICING SYSTEM

**Ronald J. O'Shea; Joseph P. Balkey, both of Charleston; Andre Hooper, South Charleston, and Richard A. Kelly, III, St. Albans, all of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.**

**Filed Sep. 30, 1981, Ser. No. 307,217**
**Int. Cl.³ B65B *3/04***
**U.S. Cl. 141—98** **19 Claims**



1. A mobile system for effecting the transfer of a flowable medium with respect to at least one independent tank, said tank having an orifice for the flow of the flowable medium, comprising:

(a) a mobile frame adapted to be moved adjacent to the tank;

(b) at least one variable duct movably affixed at one end to the mobile frame and adapted for insertion into the orifice of the tank, said variable duct being adapted to provide for the multidirectional movement of its other end with respect to the mobile frame; and

(c) at least one variable walkway movably affixed at one end to the mobile frame, said variable walkway being independent of the variable duct and being adapted to provide for multidirectional movement of its other end with respect to the mobile frame, said other end being adapted to contact the tank to provide access thereto,

whereby said mobile frame, variable duct, and variable walkway are adapted for independent movement to provide an integrated interaction with the tank for access between the tank and mobile frame and for the transfer of a flowable medium with respect to the tank.

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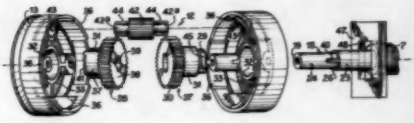
**4,422,486**

## TRIMMING MACHINE

**Jean C. Maret, Paris, France, assignor to Aciers et Outillage Peugeot, Paris, France**

**Filed Jan. 21, 1981, Ser. No. 227,120**
**Claims priority, application France, Jan. 22, 1980, 80 01285**
**Int. Cl.³ B27C *1/00***
**U.S. Cl. 144—117 R** **5 Claims**



1. A machine for trimming pieces of wood, such as a surfacing machine, planing machine or other machine, comprising a frame, a support carried by the frame on which support said pieces of wood are supported, a rotary tool adapted to machine at least one surface of said pieces of wood, two driving rollers for driving said pieces of wood in a given direction through the machine along said support, said rollers being provided respectively on an input side and an output side of the tool relative to said given direction and having shafts having axes parallel to the axis of rotation of the tool, and transmission means comprising a sun and planet train speed reducing mechanism connecting the rollers to the tool so that the rollers are rotatable by the tool, a first sun wheel of the sun and planet train being directly mounted on the shaft of a first of the driving rollers and being connected to rotate with said shaft of said first driving roller and a second sun wheel of the sun and planet train being a reaction sun wheel which is freely rotatably mounted on said shaft of said first driving roller, means for preventing the second sun wheel from rotating relative to said frame, means for mounting the shaft of said first roller on the frame so that the shaft is slidable relative to the frame in a plane containing the axis of the shaft of said first roller toward and away from said support, and elastically yieldable means for biasing said first driving roller toward said support.

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**4,422,487**

## MULTI-DOG LOG CARRIAGE

**Gerald D. McCurdy, Klamath Falls, Oreg., assignor to The Coe Manufacturing Company, Painesville, Ohio**

**Filed Mar. 3, 1982, Ser. No. 354,238**
**Int. Cl.³ B27B *29/00, 29/08***
**U.S. Cl. 144—245 R** **4 Claims**

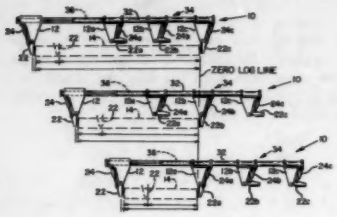
1. An adjustable, end-dogging log carriage supportingly guided on a longitudinally-extending track for processing random-length logs comprising:

(a) movable dog means movably supported on said track for supportingly engaging one end of a log;

(b) a plurality of fixed dog means fixedly spaced relative to each other but movably supported on said track for selec-

tively supportingly engaging the other end of the log, with each one of said plurality of fixed dog means being longitudinally and fixedly spaced from each other one;

(c) independently-actuated dog operating means for selectively extending and retracting each one of said plurality of fixed dog means and said movable dog means;




(d) dog drive means associated with said movable dog means for displacing said movable dog means along said track with respect to said fixed dog means and clamping the log between said movable dog means and a selected one of said plurality of fixed dog means; and

(e) carriage means for moving said plurality of fixed dog means and said movable dog means in unison along said track.

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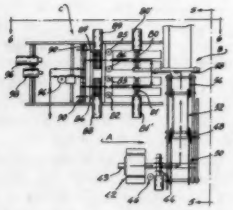
**4,422,488**

## MACHINE FOR PRODUCING DRAWER-SIDES

**Paul H. Lacroix, Ste-Foy, and Ernest Lacasse, St-Romuald, both of Canada, assignors to Centre de Recherche Industrielle du Quebec, Quebec, Canada**

**Filed Sep. 9, 1981, Ser. No. 300,481**
**Int. Cl.³ B27M *3/18*; B27C *9/04*; B27F *1/02, 1/08***
**U.S. Cl. 144—368** **20 Claims**



9. A machine for continuous production of pairs of drawer-sides from a panel of a thickness slightly greater than twice the thickness of one drawer-side, said machine comprising:

(a) first sawing means for cutting the panel to a predetermined drawer-side height;

(b) second sawing means adjacent said first sawing means for cutting off each panel to a predetermined drawer-side length;

(c) third sawing means adjacent said second sawing means for slitting each panel in two, through its thickness, in order to produce two boards of substantially equal dimensions;

(d) a smoothing table adjacent said third sawing means receiving the two boards laid flat and separated from one another, said table including means for planing the two surfaces, upper and lower, of each of the boards, and the two longitudinal edges thereof;

(e) means adjacent said smoothing table for subsequently moving the two boards towards each other;

(f) a machining table adjacent said moving means including horizontal and vertical dove-tailing heads for producing, at one end of the two boards, a male dove-tail and, on the upper surfaces of said boards, a female dove-tail.

17. A method for continuous production of pairs of drawer-sides from a panel of a thickness slightly greater than twice the thickness of one drawer-side, consisting in: cutting the panels successively, by means of saws, to a predetermined drawer-side height; cutting the panels thus cut, by means of cut-off saws, to a predetermined drawer-side length; slitting the cut panels through their thickness in order to obtain two boards of substantially equal dimensions; laying the boards flat, separately, upon a smoothing table; planing separately the upper and lower surfaces, and the longitudinal edges, of the two boards and grooving the upper surfaces thereof in such a manner as to obtain a longitudinal groove in each board; bringing the two boards together; producing, in a single step and by means of a horizontal dove-tailing head, a male dove-tail at one end of the two adjacent boards and, by means of a vertical dove-tailing head, a female dove-tail in the upper surface of each board.

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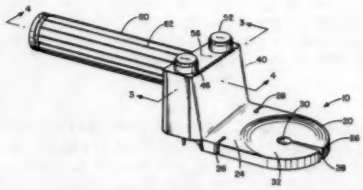
**4,422,489**

## COMBINATION NAIL HOLDER, NAIL SHIELD, AND NAIL FINISHING SET

**Gary Ross, 2811 Colorado Ave., #3, Santa Monica, Calif. 90404**

**Filed Oct. 22, 1982, Ser. No. 436,015**
**Int. Cl.³ B25C *3/00***
**U.S. Cl. 145—46** **8 Claims**



1. A combination tool comprising:

a. a gripping body member formed in a substantially U-shaped configuration with the curved portion of the U forming the forward edge of the tool;

b. a multiplicity of very narrow V-shaped grooves, each of which extends inwardly from the outer edge of the gripping body member and each of which extends through the entire thickness of the gripping body member;

c. the apex of one or more of said very narrow V-shaped grooves terminating in and extending into an opening within the interior of said gripping body member;

d. each of said interior openings associated with a very narrow V-shaped groove also extending through the entire thickness of said gripping body member;

e. a mid-body member located at the rear of said gripping body member and extending transversely from the upper surface of said gripping body member such that cavities are formed on either side of the rear portion of the gripping body member and beneath the mid-body member;

f. a pair of substantially cylindrical openings extending through the entire height of said mid-body member;

g. a pair of headed substantially cylindrical tapering shafts, one of which is received within each of said substantially cylindrical openings in said mid-body member such that the head of each shaft rests on the upper surface of said mid-body member and the tip of each shaft protrudes through the lower surface of said mid-body member and into the cavity on either side of the rear portion of said gripping body member and below said mid-body member; and

h. a handle extending from the rear surface of said mid-body member;

i. whereby each very narrow V-shaped groove can be used to hold a nail in any desired direction while it is hammered

into a surface of an object, the combination tool can act as a shield to protect the surface during the hammering process, and either of the substantially cylindrical tapering shafts can be used as a nail set to hammer the nail slightly below the surface of the object.

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**4,422,490**

## VEHICLE ROAD WHEELS AND TIRES

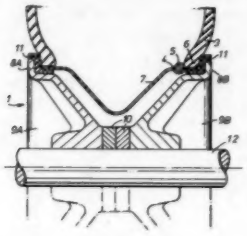
**Derek J. Power, Chiswick, England, assignor to Minilite Limited, Great Britain**

**Filed Feb. 10, 1981, Ser. No. 233,090**

**Claims priority, application United Kingdom, Feb. 13, 1980, 8004732**

**Int. Cl.³ B60C 5/16; B60B 3/08**

**U.S. Cl. 152—394** **6 Claims**



1. A vehicle road wheel and tire sealing assembly comprising:

an annular integral tire sealing means for receiving both the inner and outer beads of a tire and for sealing the tire for inflation;

a vehicle road wheel of split rim form having inboard and outboard rim parts releasably secured together to hold said sealing means in position around the rim parts, the sealing member being releasable from the rim parts by separating these parts; and

means for transferring torque between said annular tire sealing means and said inboard and outboard rim parts consisting solely of resilient means, including inboard and outboard non-rigid torque transfer bands respectively fitted to the inboard and outboard rim parts and with which inboard and outboard areas of said annular sealing member are respectively engaged to provide a positive but resilient coupling between said wheel and said tire sealing means.

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**4,422,491**

## COLLAPSIBLE AWNING FRAME

**Joseph B. Cusick, III, P.O. Box 66, Peck, Kans. 67120**

**Filed Jul. 10, 1981, Ser. No. 282,008**

**Int. Cl.³ E04F 10/04**

**U.S. Cl. 160—58 R** **8 Claims**

1. A collapsible awning frame for mounting in front of the opening of a window, door, or the like, the frame comprising:

a first hinge and a second hinge adapted for mounting on the opposite sides of the opening;

a first vertical rod having a lower end attached to the first hinge and extending upwardly therefrom;

a second vertical rod having a lower end attached to the second hinge and extending upwardly therefrom;

a horizontal upper tie rod having opposite ends attached to the upper ends of the first and second vertical rods;

a first fold rod having one end attached to the first hinge;

a second fold rod having one end attached to the second hinge;

a horizontal lower tie rod having opposite ends attached to the other ends of the first and second fold rods;

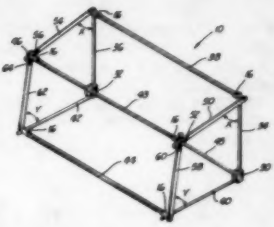
a first slide rod having one end attached to the first hinge;

a second slide rod having one end attached to the second hinge;

a horizontal extension tie rod having opposite ends attached to the other ends of the first and second slide rods;

a first upper slide arm having one end attached to the upper tie rod and the other end attached to the extension tie rod;

a second upper slide arm having one end attached to the



upper tie rod and the other end attached to the extension tie rod;

a first lower slide arm having one end attached to the extension tie rod and the other end attached to the lower tie rod; and

a second lower slide arm having one end attached to the extension tie rod and the other end attached to the lower tie rod.

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**4,422,492**

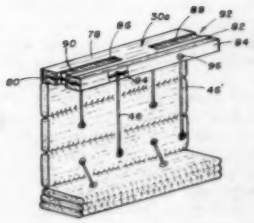
## INSULATING SHADE DEVICE

**Billy M. Bledsoe, Rte. 2, Fulton Rd., Corryton, Tenn. 37721**

**Filed Aug. 4, 1980, Ser. No. 175,314**

**Int. Cl.³ E06B 3/94; A47H 5/00**

**U.S. Cl. 160—84 R** **4 Claims**



1. An insulating shade device for increasing the thermal resistance and minimizing convective drafts at windows having a pane and a frame for supporting said pane, said frame including an upper cross member or lintel, a lower cross member or sill, and uprights, said device comprising:

a shade having a multiplicity of insulating members, each of said members being proportioned for covering a section of said pane, said shade including means for joining said members such that the shade can be folded for storage and unfolded for creating an insulating cover over the window, said shade defining an upper end portion and a lower end portion;

a support unit joining said upper end portion of said shade and suitable for attaching said shade proximate said upper lintel, said support unit including an upper cross member and a lower cross member, said cross members being pivotally connected along one edge of said unit, said support unit further including shade tension means for biasing said lower support member towards said upper support member, whereby said shade is placed under

tension and maintained in a substantially vertical plane upon securing the lower end portion of said shade to said window sill;

means for drawing said shade to its folded position; and

means for positioning the shade at any stage of deploying such that a preselected portion of the window can be covered.

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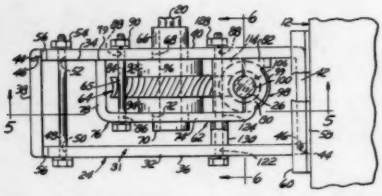
**4,422,493**

## SUPPORT MEMBERS AND GEAR DRIVE FOR SHUTTER AND AWNING DEVICES

**William F. Forquer, Venice, Fla., assignor to Security Shutter Corp., Venice, Fla.**

**Filed Dec. 16, 1981, Ser. No. 331,257**
**Int. Cl.³ E06B 9/08**
**U.S. Cl. 160—133** **10 Claims**



1. In a protective shutter assembly for an opening in a wall or the like comprising an articulated curtain of a plurality of interlocked elongated rigid slats assembled hingedly relative to each other, a drive mechanism for raising and lowering said articulated curtain, said drive mechanism comprising a shaft having an axis of rotation disposed substantially parallel to the longitudinal axis of said slats, and support members for rotatably supporting said shaft at each end for winding said curtain about said shaft, the improvement comprising one of said support members being an open-ended enclosure having a pair of substantially parallel long sidewalls interconnected by a pair of substantially narrow sidewalls, support bracket means for supporting said enclosure from a wall with said relatively long sidewalls substantially perpendicular to the axis of said shaft, bearing means mounted on the end of said shaft and rotatably supported in a first aperture through one of said long sidewalls, a U-shaped saddle member having a second aperture providing a journal for a portion of said bearing means, a worm wheel mounted and coupled to said shaft within said U-shaped saddle member, a worm gear tangentially meshing with said worm wheel, said worm gear being mounted on and coupled to a drive shaft rotatably supported by said saddle member, wherein said saddle member has a partially cylindrical recess in supporting engagement with said drive shaft, and fastening means for attaching said U-shaped saddle to the inside surface of said long sidewall with said apertures substantially aligned.

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**4,422,494**

## VIBRATORY FORMING OF SHAPED LEAD JOINTS

**William J. Chafin, Alexandria, and Ben C. Brown, Muncie, both of Ind., assignors to General Motors Corporation, Detroit, Mich.**

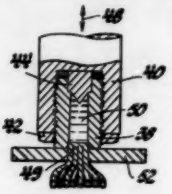
**Filed May 4, 1981, Ser. No. 259,975**
**Int. Cl.³ B22D 19/04, 23/06**
**U.S. Cl. 164—80** **4 Claims**

1. A process for forming a substantially metallurgically homogeneous shaped joint between discrete, solid lead parts comprising the steps of:

gathering said parts together in contacting relationship to form a cluster;

positioning a mold about said cluster, said mold having a cavity therein for receiving and molding said cluster into a desired shape conforming substantially to said cavity;

subjecting said cluster to high frequency mechanical vibrations of sufficient intensity to melt said parts and cause the melt so formed to assume said shape in said cavity;



allowing said melt to resolidify into a substantially metallurgically homogeneous mass constituting said joint; and

removing said joint from said mold.

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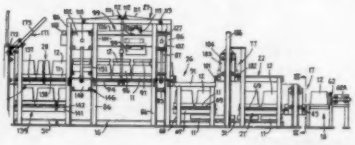
**4,422,495**

## MOLD HANDLING SYSTEM

**Adair B. Van Nette, III, Clinton Township, Seneca County, Ohio, assignor to Joseph B. Stinson Co., Fremont, Ohio**

**Filed Feb. 26, 1981, Ser. No. 238,342**
**Int. Cl.³ B22D 5/02, 5/00, 47/02, 33/04**
**U.S. Cl. 164—324** **12 Claims**



1. An apparatus for handling molds supported on cars which have pairs of wheels for permitting rolling displacement of the cars, said apparatus comprising:

first elongated guide rail means for permitting empty mold cars to be rollingly moved therealong in a first direction from one end of said first rail means toward its other end, said first rail means extending approximately horizontally;

second guide rail means positioned above and approximately vertically aligned with said first rail means for permitting mold-bearing cars to be rollingly moved therealong in a second direction which is opposite said first direction, said second rail means being horizontally elongated and having a first end thereof disposed substantially directly over said other end of said first rail means, and said second rail means having a second end thereof disposed substantially directly over said one end of said first rail means;

first elevator means positioned directly adjacen said other end of said first rail means for vertically lifting mold cars from said first rail means adjacent said other end to said second rail means adjacent said first end;

means for positioning a preformed mold on each empty mold car when the latter is supported by said first elevator means;

said second rail means including a first horizontally-elongated rail section which extends from said first end through a selected distance to a first location for permitting mold-bearing cars to be rollingly supported thereon;

horizontal pouring deck means positioned vertically above at least a portion of said first rail section so that the mold-bearing cars pass under said deck means as the cars move toward said first location, said deck means being positioned directly adjacent said first location and extending therefrom in a direction upstreamm of said first rail section;

second elevator means disposed at said first location for vertically raising the mold-bearing cars from said first rail

section into a raised position adjacent said deck means for permitting molten metal to be poured into the mold;

said second rail means including a second horizontally-elongated rail section which extends from said first location downstream to a second location, said second rail section being vertically spaced upwardly relative to said first rail section so as to receive thereon the mold-bearing car when the second elevator means is in said raised position;

pouring means positionable adjacent said second elevator means for pouring of the mold when the mold-bearing car is in said raised position at said first location;

handling means for positioning a sleevelike jacket on the mold prior to pouring of the mold when the mold-bearing car is in said raised position at said first location, and for removing the jacket from the mold after the mold-bearing car has been moved along said second rail section into said second location;

said handling means including elongated trolley rail means extending horizontally between said first and second locations and vertically above said second rail section, driving means for vertically raising and lowering the trolley rail means between upper and lower positions, a trolley rollingly supported on the trolley rail means and means to drive the trolley horizontally back-and-forth along the trolley rail means between said first and second locations, engaging means attached to the trolley to engage the mold jackets to raise and lower the mold jackets in response to the respective raising and lowering of the trolley rail means by said driving means, and said driving means and said means to drive the trolley being arranged downstream in said second direction of said pouring means;

said second rail means including a third horizontally-elongated rail section which extends from said second location downstream to said second end, said third rail section permitting the mold-bearing cars to be rollingly moved therealong for permitting cooling of the molds;

third elevator means located at the second end of said second rail means for vertically lowering the car from said second rail means downwardly for engagement with said first rail means adjacent said one end thereof; and

means for removing the mold from the car prior to the car being returned to said first rail means.

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**4,422,496**

## PROCESS FOR PREPARING OLIVINE SAND CORES AND MOLDS

**Charles E. Seeney, Brazil; John F. Kraemer, and Janis Ingebrigtsen, both of Terre Haute, all of Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.**

**Division of Ser. No. 342,309, Jan. 25, 1982, Pat. No. 4,396,431. This application Jan. 10, 1983, Ser. No. 456,951**

**Int. Cl.³ B22C 1/18**

**U.S. Cl. 164—528** **9 Claims**

1. An improved process for preparing foundry cores and molds from a foundry aggregate and an inorganic cement binder therefor, comprising the steps of (a) mixing the aggregate with potassium olivine phosphate and as a hardener therefor water, aqueous sodium silicate, or aqueous phosphoric acid, (b) delivering the resulting mixture into a core box or mold box and (c) allowing to stand for a length of time sufficient for the binder to cure and form the core or mold.

**4,422,497**

## DEVICE OF CONTROLLING THE IDLING SPEED OF AN ENGINE

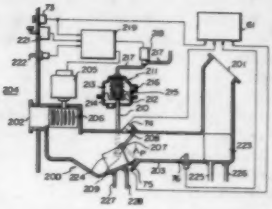
**Norio Komoda, Aichi; Nobuyuki Kobayashi, Toyota; Hiroshi Itoh, Nagoya; Yozi Nishimura, Toyota, and Shigenobu Obara, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Dec. 3, 1981, Ser. No. 327,115**

**Claims priority, application Japan, Jun. 5, 1981, 56-85628**

**Int. Cl.³ B60H 3/04; F22B 21/04**

**U.S. Cl. 165—23** **6 Claims**



1. A device of controlling the idling speed of an engine of a vehicle having an air conditioning apparatus for cooling a driver's compartment, said engine comprising a main intake passage, a throttle valve arranged in the main intake passage, a bypass passage branched off from the main intake passage upstream of the throttle valve and connected to the main intake passage downstream of the throttle valve, a control valve arranged in the bypass passage, and a step motor actuating the control valve for controlling the amount of air flowing within the bypass passage, said air conditioning apparatus comprising an air duct which interconnects the driver's compartment to the exterior of the vehicle, a suction fan arranged in the air duct, an evaporator arranged in the air duct, a heat exchanger arranged in the air duct at a position located downstream of the evaporator, and an air mixture damper arranged in the air duct between the evaporator and the heat exchanger for controlling the amount of air directly flowing into the driver's compartment and for controlling the amount of air flowing into the driver's compartment via the heat exchanger, wherein said device comprises: first means for detecting the engine speed to produce a first signal indicating the engine speed; second means for detecting the operating condition of the engine to produce a second signal indicating that the engine is operating in an idling state; third means arranged in the air duct for producing a third signal indicating the temperature of air which has passed through the evaporator; fourth means cooperating with the air mixture damper for producing a fourth signal indicating that the entire air directly flows into the driver's compartment without passing through the heat exchanger, and; electronic control means in response to said first signal, said second signal, said third signal and said fourth signal for rotating the step motor in a rotating direction wherein the engine speed approaches a predetermined desired idling speed when the engine is operating in an idling state, said desired idling speed being increased when the temperature of air which has passed through the evaporator is higher than a predetermined temperature and when said fourth means produces said fourth signal.

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**4,422,498**

## MACHINE TOOL COOLING SYSTEM

**Po-Shiun Chen, Taichung Hsuan, Taiwan, assignor to YCI USA, Inc., Compton, Calif.**

**Filed Sep. 8, 1981, Ser. No. 299,834**

**Int. Cl.³ F16H 7/02**

**U.S. Cl. 165—47** **2 Claims**

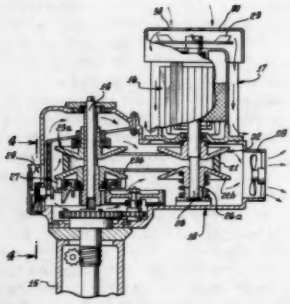
1. In a machine tool of the type including a vertical spindle coupled with a rotary tool and mounting a driven V-pulley, a

spindle drive motor including a drive shaft projecting parallel to said spindle and mounting a drive V-pulley aligned with said driven V-pulley, a drive belt trained over said pulleys and a housing housing said motor, shaft, spindle and V-pulleys, the improvement comprising:

a first housing section housing said spindle drive motor and formed with a motor air cooling passage leading from a first inlet to define a downwardly directed heat exchange passage for directing air in heat exchange relationship with said motor and then terminating in a first outlet spaced downwardly from said first inlet;

a second discrete housing section housing said V-pulleys and drive belt and forming a discrete horizontally elongated substantially straight passage leading from a second inlet disposed on one side of said driven pulley to a second outlet disposed on the side of said drive pulley opposite said one side to define a straight power transmission air cooling passage for directing air from said second inlet in direct heat exchange relationship with said driven pulley, drive belt, drive pulley and directly out said second outlet;

impeller means in said first housing section and coupled with said motor drive shaft to draw cooling air in said first inlet



to flow in heat exhange relationship with said motor to be exhausted out said first outlet;

a fan mounted on said second housing section for drawing air out said second outlet to create a negative pressure at said second outlet to positively draw cooling air in said second inlet to flow over said driven pulley, along the length of said drive belt, over said drive pulley to exhaust directly out said second outlet;

a fan drive motor mounted on said second housing and coupled with said fan to drive said fan at a speed independent of said spindle drive motor speed; and

control means connected with said fan drive motor for controlling said fan drive motor whereby operation of said spindle drive motor will draw ambient air in said first inlet to direct it downwardly through said motor and cooling passage, over said motor and out said first outlet and said fan drive motor may be operated independently of said spindle drive motor to draw air in said second inlet and longitudinally along said elongated straight passage over said drive pulley, over the length of said drive belt and over said drive pulley to then exhaust out said second outlet without passing through said first inlet, first passage and first outlet.

**4,422,499**

## MAKING OF STEAM GENERATOR WATER BOXES

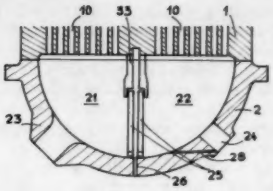
**Michel Batistoni, Dracy le Fort, France, assignor to Framatome, Courbevoie, France**

**Filed Sep. 24, 1980, Ser. No. 190,391**

**Claims priority, application France, Oct. 8, 1979, 79 24986**

**Int. Cl.³ F22B *1/134*; F28F *9/22***

**U.S. Cl. 165—71** **4 Claims**




1. Water box for a steam generator having a bank of U-shaped tubes whose ends are fixed to a tube sheet, said water box comprising a substantially hemispherical base (2) applied to said tube sheet (1) and bounding a space divided into a supply chamber (21) and an evacuation chamber (22) by a semi-circular partition plate (3) which fits with clearance over its whole periphery into a circular groove and a diametrical groove (11) respectively provided in the inner walls of said hemispherical base (2) and said tube sheet (1), said hemispherical base (2) having at least one drain orifice (26) passing through it which opens at the lowest point of said circular groove for fitting said plate (3), said orifice (26) being capable of communicating with the two chambers (21, 22) of said water box.

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**4,422,500**

## METAL HYDRIDE HEAT PUMP

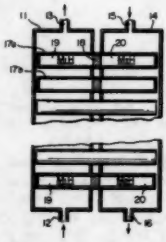
**Tomoyoshi Nishizaki, Suita; Minoru Miyamoto, Kusatsu; Kazuaki Miyamoto, Amagasaki; Ken Yoshida, Ibaraki; Katuhiko Yamaji, and Yasushi Nakata, both of Osaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan**

**Filed Dec. 23, 1981, Ser. No. 333,680**

**Claims priority, application Japan, Dec. 29, 1980, 55-185356; May 18, 1981, 56-75559**

**Int. Cl.³ F25D *15/00***

**U.S. Cl. 165—104.12** **5 Claims**




1. A metal hydride heat pump comprising a first and a second heat medium receptacle having heat media flowing therein and a plurality of closed vessels each containing a hydrogen gas atmosphere and divided into a first chamber having a first metal hydride filled therein and a second chamber having a second metal hydride filled therein, said first and second chambers of each closed vessel communicating with each other so that hydrogen gas passes from one chamber to the other but the metal hydrides do not, and a group of the first chambers of

the closed vessels being located within the first heat medium receptacle and a group of the second chambers of the closed vessels being located within the second heat medium receptacle, whereby heat exchange is carried out between the heat media in the first and second heat medium receptacles and the first and second metal hydrides through the external walls of the closed vessels,

wherein a heat medium flows in one direction in each of the first and second heat medium receptacles, and wherein the plurality of the closed vessels are sequentially arranged in each of the first and second heat medium receptacles such that with respect to the flow direction of the heat medium, a first chamber of a closed vessel located on the upstream side of the first heat medium receptacle communicates with a second chamber of a closed vessel located on the downstream side of the second heat medium receptacle, and a first chamber of the closed vessel located on the downstream side of the first heat medium receptacle communicates with a second chamber of the closed vessel located on the upstream side of the second heat medium receptacle.

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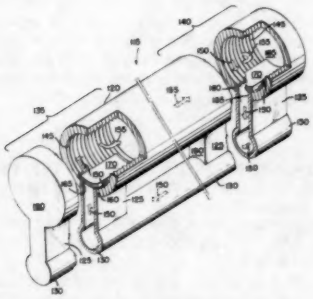
**4,422,501**

## EXTERNAL ARTERY HEAT PIPE

**James L. Franklin, Kent; Roger L. Shannon, Federal Way, and Dale F. Watkins, Sumner, all of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed Jan. 22, 1982, Ser. No. 341,949**
**Int. Cl.³ F28D *15/00***
**U.S. Cl. 165—104.26** **5 Claims**



1. Heat transfer apparatus, comprising:

a closed chamber,

a working fluid disposed in said chamber,

a plurality of grooves distributed seriatim within said chamber for conducting said fluid,

an axial fluid channel extending along said chamber, each of said grooves terminating at said channel,

an elongated cap member traversing said channel and coacting with said grooves to form a plurality of fluid passageways,

a fluid-transporting conduit extending outwardly from said channel, and

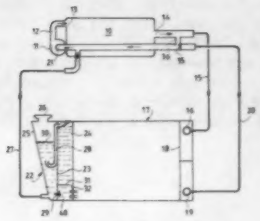
a fluid-conducting tube extending proximate said chamber in fluid communication with said conduit.

**4,422,502**

## INTEGRATED WATER BOX AND EXPANSION CHAMBER DEVICE FOR A HEAT EXCHANGER SUCH AS THE RADIATOR IN THE COOLING CIRCUIT OF AN INTERNAL COMBUSTION ENGINE

**Denis Villeval, Maurepas, France, assignor to Valeo, Paris, France**

**Filed Jul. 12, 1982, Ser. No. 397,216**
**Claims priority, application France, Jul. 16, 1981, 81 13891**
**Int. Cl.³ F01P *11/02***
**U.S. Cl. 165—104.32** **7 Claims**



1. Integrated water box and expansion chamber device for a heat exchanger such as the radiator in the cooling circuit of an internal combustion engine, wherein the expansion chamber and the water box are interconnected by a degassing passage or duct and by a suction orifice, the expansion chamber also having a bottom end which is connected to a suction inlet of a pump for circulating liquid in said cooling circuit, one way valve means being provided to close said suction orifice to prevent liquid in the water box from flowing into the expansion chamber and to open said orifice to enable liquid to flow in the opposite direction.

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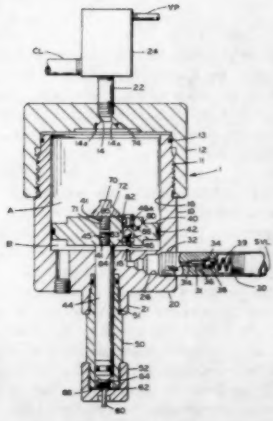
**4,422,503**

## CONTROL LINE BLOW OUT PREVENTER

**Kip B. Goans, Harvey, La., assignor to Baker Cac, Inc., Belle Chasse, La.**

**Filed Nov. 4, 1981, Ser. No. 318,290**
**Int. Cl.³ E21B *33/06***
**U.S. Cl. 166—53** **3 Claims**



1. A blow out preventer for use in a control conduit for a downhole safety valve, said safety valve being manipulatable between open and closed positions upon variation of pressure within the control conduit; said blow out preventer compris-

ing: a housing defining a cylindrical fluid chamber adapted for interposition in the control conduit and having an axially spaced fluid inlet and a fluid outlet; a piston reciprocable inside said chamber between a first position adjacent said fluid inlet and a second position adjacent said fluid outlet; said piston having two opposed faces; first valve means on one said face of said piston for closing said fluid inlet only when said piston is in said first position; a fluid passage extending axially from said one face to the other through said piston; second valve means for metering fluid flow through said fluid passage in the direction toward said one piston face; a spring pressed ball check valve disposed in said fluid outlet and constructed to block fluid flow in the conduit from the safety valve in its closed position; and a fusible link normally holding said ball check valve in an open position, whereby the melting of said fusible link upon the occurrence of abnormal temperature permits said ball check valve to close said conduit and prevent fluid flow from the safety valve upwardly through the conduit.

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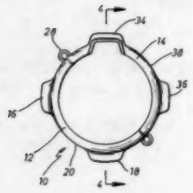
**4,422,504**

## PROTECTIVE CLAMP ASSEMBLY

**Boyd B. Moore, 427 Mignon, Houston, Tex. 77024**

**Filed Mar. 16, 1981, Ser. No. 244,233**
**Int. Cl.³ F16L *3/22***
**U.S. Cl. 166—241** **7 Claims**




1. An assembly for establishing protective transition of conductor line about the spaced enlargements formed by threaded connections on a tubular member in a well comprising:

first and second generally semicylindrical body sections;

hinge means along each side of each of said body sections for receiving a hinge pin to secure the assembly on the tubular member;

cooperating means on said body sections and the tubular member to interlock the assembly on the tubular member;

stiffener portions extending radially outwardly of each of said body sections on each side of said hinge means to protect said hinge means against damage;

enclosure means, said enclosure means comprising an internal recess formed on at least one of said body sections by a longitudinal inwardly open channel which extends radially outward of the body section for receiving the conductor line therein to protect the conductor line against crushing as it transitions the spaced enlargements formed by the tubular member threaded connections; and

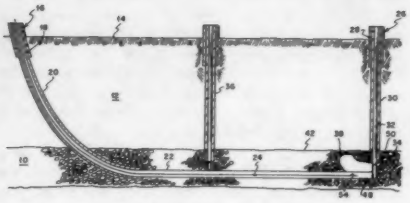
said channel having openings at each end for receiving the conductor line and said channel further including an inwardly curved portion adjacent at least one end thereof to direct the conductor line to close proximity with the tubular member adjacent at least one end of said channel.

**4,422,505**

## METHOD FOR GASIFYING SUBTERRANEAN COAL DEPOSITS

**Kenneth L. Collins, Houston, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.**

**Filed Jan. 7, 1982, Ser. No. 337,566**
**Int. Cl.³ C10J *5/00*; E21B *43/243*; E21C *43/00***
**U.S. Cl. 166—256** **10 Claims**




1. A method for gasifying a subterranean coal deposit, said method consisting essentially of:

(a) positioning a cased injection well to extend from the surface into said subterranean coal deposit and substantially horizontally through a lower portion of said coal deposit, with at least a major portion of the casing in the horizontal portion of said cased injection well being perforated casing;

(b) positioning an injection tubing in said cased injection well for the injection of a free-oxygen containing gas into said coal deposit;

(c) positioning a production well to extend from the surface to said coal deposit with a lower end of said production well being located near and in fluid communication with a lower end of said cased injection well;

(d) igniting said coal deposit;

(e) gasifying a first portion of said coal deposit between said production well and a lower end of said injection tubing by injecting free-oxygen containing gas into said coal deposit through said injection tubing and recovering product gases through said production well; and,

(f) gasifying a second portion of said coal deposit by withdrawing said injection tubing a selected distance and thereafter injecting free-oxygen containing gas into said second portion of said coal deposit and recovering product gases through said production well.

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**4,422,506**

## LOW PRESSURE RESPONSIVE APR TESTER VALVE

**Harold K. Beck, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.**

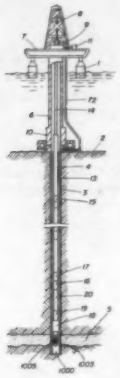
**Filed Nov. 5, 1980, Ser. No. 204,100**
**Int. Cl.³ E21B *34/10***
**U.S. Cl. 166—324** **10 Claims**

1. A valve for use in a well testing string located in a wellbore and having a packer arranged for selectively sealing the wellbore isolating that portion of the wellbore above the packer from that portion of the wellbore below the packer to allow the production of fluids from that portion of the wellbore below the packer through said valve in the testing string as well as the introduction of fluids into that portion of the wellbore below the packer through said valve in the testing string, said valve being responsive to changes in the pressure of the fluid in the annulus between the wellbore and the well testing string in that portion of the wellbore above the packer when the packer sealingly engages the wellbore, said valve comprising:

valve section means having a valve means therein in a closed position to prevent the flow of fluid through the well testing string, the valve means being responsive to changes in the pressure of the fluid in the annulus to open

the valve means to allow the flow of fluid through the well testing string;

power section means responsive to changes in the pressure of the fluid in the annulus, the power section means having first means therein adapted to move the valve means of the valve section means to the open position and having resilient means therein adapted to return the valve means of the valve section means to the closed position from the open position in response to a change in the pressure of the fluid in the annulus; and



isolation valve means for being continuously responsive substantially without interruption during such time as said valve is located in said wellbore to changes in the pressure of the fluid in the annulus to maintain the resilient means of the power section means at a level of force sufficient to close the valve means of the valve section means regardless of the hydrostatic pressure and temperature of the fluid in the annulus and the pressure ahnd temperature of the fluid in said valve in the testing string.

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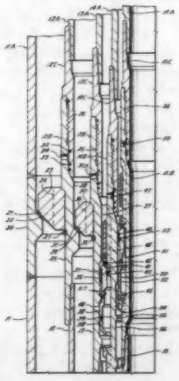
**4,422,507**

## WELLHEAD APPARATUS

**Larry E. Reimert, Houston, Tex., assignor to Dril-Quip, Inc., Houston, Tex.**

**Filed Sep. 8, 1981, Ser. No. 300,001**
**Int. Cl.³ E21B *43/01***
**U.S. Cl. 166—348** **12 Claims**



1. Apparatus for use in suspending concentric strings of casing of an offshore well at the ocean floor, comprising an outer hanger having a bore therethrough and adapted to be landed at the ocean floor, said outer hanger having at least three vertically spaced, upwardly facing seating surfaces which are parallel to one another and extend radially outwardly from the bore thereof, an inner hanger including a body having a bore therethrough and adapted to be lowered into the bore of the outer hanger, the outer side of the inner hanger body having a recess thereabout, and a ring received within the recess and having a plurality of vertically spaced, downwardly facing landing surfaces which are parallel to one another and the seating surfaces of the outer hanger, said ring being radially expandible, as the inner hanger body is lowered into the bore of the outer hanger to cause the landing surfaces thereof to move into supported positions on the seating surfaces of the outer hanger, means for supporting the inner hanger body on the ring when the ring is so supported from the outer hanger, and means on each of the outer and inner hanger bodies from which a casing string may be suspended for lowering within a bore drilled into the ocean floor to which an upper continuation of the casing string may be connected for extension back to water surface.

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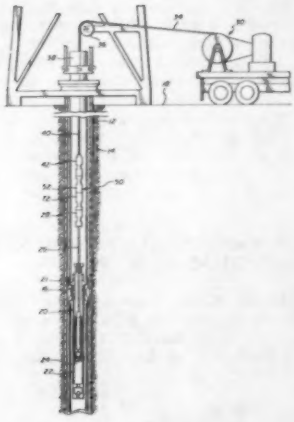
**4,422,508**

## METHODS FOR PULLING SUCKER ROD STRINGS

**Woodrow T. Rutledge, Jr.; Russel P. Rutledge, and John E. Freeman, Jr., all of Big Spring, Tex., assignors to Fiberflex Products, Inc., Big Spring, Tex.**

**Filed Aug. 27, 1981, Ser. No. 296,633**
**Int. Cl.³ E21B *17/06, 19/16***
**U.S. Cl. 166—376** **2 Claims**



1. A method of enabling the combination of steel suckers rods and fiberglass sucker rods to be joined together to form a sucker rod string which are connected to a downhole reciprocating pump to be pulled from a tubing string of a well comprising the steps of:

(a) installing a separable connector having at least one shear pin therein between the sucker rod string and the downhole reciprocating pump, such separable connector being joined only by said shear pin;

(b) applying a tension force to the sucker rod string, wherein said tension force is significantly greater than the tension force required for normal operation of the downhole reciprocating pump, and then shearing the pin of the separable connector, whereby the sucker rod string is disconnected from the downhole reciprocating pump; and,

(c) pulling the sucker rod string from the tubing without the downhole reciprocating pump being attached thereto, thereby preventing the downhole reciprocating pump

from stripping accumulated scale, parrafin, and other precipitate from the interior surface of the tubing string and thereby eliminating the necessity of rotating the sucker rod string to free the downhole reciprocating pump from an engagement with the accumulated scale, parrafin, and other precipitate which otherwise prevents the continued removal of the downhole reciprocating pump from the tubing.

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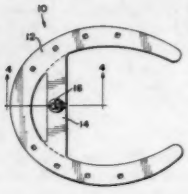
**4,422,509**

## PROSTHETIC HORSESHOE

**Roger W. Mercer, II, 623 W. Church Rd., Sterling, Va. 22170**

**Filed May 7, 1982, Ser. No. 375,960**
**Int. Cl.³ A01L** *1/00, 7/00*
**U.S. Cl. 168—4** **3 Claims**




1. For use in the treatment of a horse having laminitis, a prosthetic horseshoe comprising:

(a) a horseshoe having the general shape of a hoof and adapted for fastening to a hoof of said horse, said horseshoe having a lateral bar, the ends of which are integral with the sides of said horseshoe; and,

(b) biasing means supported by the lateral bar of said horseshoe and adapted for rotating the out of position coffin bone to its normal position in the foot of said horse, said biasing means being an upwardly protruding screw adjustably supported by the lateral bar of said horseshoe, the longitudinal axis of said screw being at an angle less than 90 degrees with the upper face on said horseshoe.

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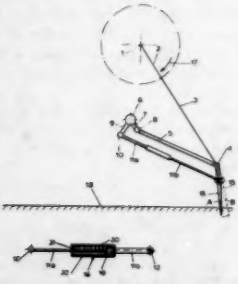
**4,422,510**

## APPARATUS FOR THE PROVISION OF VERTICAL DRAIN CHANNELS IN GRASS, FIELDS, MEADOWS ETC.

**Arie-Jan de Ridder, Soesterberg, Netherlands, assignor to Redexim Holding S.A., Bulle, Switzerland**

**Filed Mar. 6, 1981, Ser. No. 241,211**
**Claims priority, application Netherlands, Mar. 10, 1980, 8001412**
**Int. Cl.³ A01B** *45/02*
**U.S. Cl. 172—21** **4 Claims**



1. Apparatus for providing substantially vertical drain channels in the ground such as in an open field, turf, meadow or the like, comprising a frame adapted to move along the ground having a rotary shaft journalled therein and one or more sets of pins adapted to penetrate the ground, at least one set of pins being connected to a lever system driven by said rotary shaft for reciprocal vertical movement, said lever system comprising a pair substantially parallel spaced rods connected at one end pivotally to the associated pins one below the other and at their other ends pivotally to said frame offset from each other, said lower one of said rods having resilient means for extending its length when said pins are placed under a load and for automaticly resuming its normal length when said load is removed.

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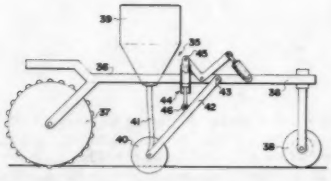
**4,422,511**

## HYDRAULIC RESET FOR TILLAGE AND SEEDING EQUIPMENT

**Erhard Poggemiller, Box 128, Loseland, Saskatchewan, Canada S0L 2A0, and Ralph Sweet, Box 3, Forgan, Saskatchewan, Canada S0L 1G0**

**Continuation-in-part of Ser. No. 25,399, Mar. 30, 1979, Pat. No. 4,353,423, which is a continuation-in-part of Ser. No. 835,049, Sep. 21, 1977, abandoned. This application Jun. 23, 1982, Ser. No. 391,457**
**Int. Cl.³ A01B** *61/04, 63/32*
**U.S. Cl. 172—260.5** **28 Claims**




1. In an agricultural implement which includes a frame, and a ground engaging tool assembly pivotally supported upon said frame, an hydraulic system including a variable displacement pump, a high pressure line extending from said pump, a main hydraulic ram operatively connected to said high pressure line and to said ground engaging tool assembly for controlling and presetting the depth of penetration of said ground engaging tool assembly; the improvement comprising in combination a resetting ram assembly for said ground engaging tool assembly, operatively extending between said ground engaging tool assembly and said frames, means operatively connecting said resetting ram assembly to the hydraulic system and means to adjust the hydraulic pressure within said resetting ram assembly below pump pressure whereby said resetting ram assembly is normally fully at one end of the stroke thereof until a predetermined pressure upon said ground engaging tool assembly is exceeded, said last mentioned means comprising a pressure reducing valve assembly operatively connected between said high pressure line and said resetting ram assembly to conrol and sense the pressure downstream of said valve assembly, said ground engaging tool assembly including at least one coulter assembly mounted for pivotal action to said frame, said resetting ram assembly being operatively connected between said main hydraulic ram and said coulter assembly.

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**4,422,512**

## NARROW-BASE TERRACING PLOW

**Emory R. Hodgson, Jr., Yazoo City, Miss., and Darryl C. Rester, Baton Rouge, La., assignors to Dynamics Corporation of America, Greenwich, Conn.**

**Filed Jun. 1, 1981, Ser. No. 269,521**
**Int. Cl.³ E02F** *5/22*
**U.S. Cl. 172—454** **17 Claims**

1. A narrow-base terracing plow comprising:

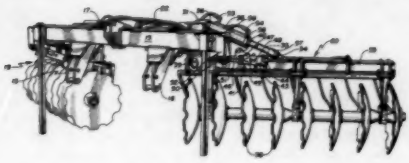
(a) a frame constructed and arranged to be connected to and supported by a tractor to extend transversely thereof;

(b) a harrow gang having inner and outer end portions and

being mounted on said frame adjacent its inner end portion for pivotal movement relative to said frame about a generally horizontal axis extending transversely of said frame and extending laterally outwardly from said axis;

(c) controllable hydraulic power means pivotally mounted on said frame and extending between and being pivotally connected to said harrow gang at a point located outwardly of said axis;

(d) said power means being constructed and arranged to controllably move said harrow gang relative to the



ground and said frame between lowered operative and elevated non-ground-engaging positions; and

(e) said power means also being constructed and arranged to force and hold said harrow gang while operative in an off-horizontal position with its outer end portion substantially depressed relative to said axis and to its said inner end portion, and to elevate said harrow gang to its elevated non-ground-engaging position above said frame independently of any other such harrow gangs which may be carried by said frame with its outer end portion substantially elevated relative to its said inner end portion.

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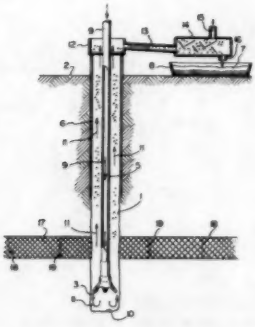
**4,422,513**

**GAS HYDRATES DRILLING PROCEDURE**

**Lindsay J. Franklin, Box 7, Site 26, R.R. #2, Calgary, Alberta, Canada T2P 2G5**

**Filed Jul. 6, 1981, Ser. No. 280,346**
**Int. Cl.³ E21B *21/00, 21/06***
**U.S. Cl. 175—17** **4 Claims**



1. A method of drilling in a hydrate-containing stratum comprising the steps of:

(a) forming a wellbore by drilling into the hydrate-containing stratum;

(b) continuously feeding a drilling mud into said wellbore;

(c) maintaining the density of said mud at a level sufficiently low to promote the melting of hydrates; and

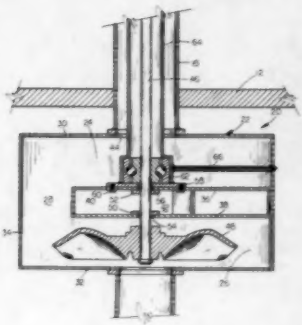
(d) continuously discharging the mud/gas mixture thus produced from the wellbore as quickly as the mixture is produced.

**4,422,514**

**PUMP FOR A REVERSE CIRCULATION ROTARY DRILLING RIG**

**Wayne A. Grosch, R.R. #2, Osceola, Nebr. 68651**

**Filed Sep. 28, 1981, Ser. No. 305,915**
**Int. Cl.³ E21B *21/00***
**U.S. Cl. 175—213** **4 Claims**



1. A pump for a reverse circulation drilling rig, including

a hollow Kelly bar having upper and lower ends,

a generally cylindrical-shaped housing having upper and lower ends,

said housing having a central discharge opening formed in its upper end which communicates with the lower end of the Kelly bar,

means securing the upper end of said housing to said Kelly bar,

said housing having a central inlet opening formed in its lower end for receiving the drilling fluid being circulated,

said housing defining spaced-apart first and second compartment areas,

said housing having a fluid passageway at one side thereof which extends between said first and second compartment areas,

a shaft rotatably mounted and extending downwardly through the Kelly bar, through said first compartment area and into said second compartment area,

a pump impeller means on said shaft in said second compartment area for pumping fluid inwardly through said inlet opening, outwardly from said second compartment area, through said fluid passageway and said first compartment area and upwardly through said Kelly bar,

a bearing means operatively secured to said housing in said first compartment area embracing said shaft,

a pipe means extending downwardly through the Kelly bar positioned around said shaft for preventing fluid from coming into contact with said shaft,

the lower end of said pipe means enclosing said bearing means in said first compartment area for preventing fluid in said first compartment area from coming into contact with said bearing means,

and means extending from said housing for connection to drilling pipe.

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**4,422,515**

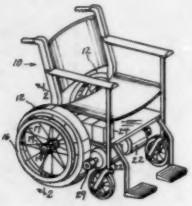
**MOTORIZED WHEEL CHAIR**

**John H. Loveless, Westminster, Md., assignor to Government of the U.S. as represented by Admin. of Veterans Affairs, Washington, D.C.**

**Filed Jul. 29, 1981, Ser. No. 288,197**
**Int. Cl.³ B62D *11/04***
**U.S. Cl. 180—6.5** **10 Claims**

1. In a motorized wheelchair for providing transportation for human passengers, said chair including ground-engaging

drive wheels and respective independent electric motors drivingly coupled to the drive wheels, the improvement comprising hand rim means freely journalled on said wheel chair, transducer means comprising means for generating electrical



signals responsive to the rotational velocity of said hand rim means relative to said wheel chair, and velocity controller means, connected to and energizing said motor, for controlling the speed of the motors responsive to and in accordance with said electrical signals.

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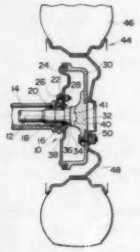
**4,422,516**

## AXLE HOUSING LEAK OIL DISCHARGING DEVICE

**Tadao Yamaura, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Dec. 19, 1980, Ser. No. 218,332**
**Claims priority, application Japan, Dec. 20, 1979, 54-166214**
**Int. Cl.³ B60B *35/12***
**U.S. Cl. 180—70 R** **5 Claims**



1. A device in combination with a wheel axle shaft and housing, comprising:

a wheel bearing positioned between the housing and the axle shaft;

an annular spacer mounted on the axle shaft at a location interposed between and in contact with said bearing and an enlarged diameter section of the axle shaft, said enlarged diameter section extending into a brake drum of a frictional braking device for frictionally braking a wheel;

a plate member secured to a flange section of the axle housing and having a central opening through which the enlarged diameter section of the axle shaft passes to enter the brake drum, said plate member forming part of said braking device;

a first annular flange formed as an integral part of said annular spacer and extending radially therefrom in a manner to collect oil that seeps through the wheel bearing and to splash the collected oil radially outwardly therefrom by the centrifugal force generated by the rotation of the axle shaft; and

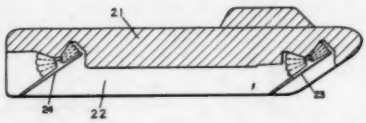
means radially spaced from and surrounding said annular flange to collect the splashed oil and to guide the same to the exterior of said housing.

**4,422,517**

## BAG-POSITIONED HINGED SEALS FOR AIR CUSHION VEHICLES

**Peter G. Hammerschlag, 220 - 111th Ave. SE., Bellevue, Wash. 98004**

**Filed May 4, 1977, Ser. No. 793,845**
**Int. Cl.³ B60V *1/04, 1/16***
**U.S. Cl. 180—127** **3 Claims**



1. In a water-traversable vehicle of the type having a hull with depending sidewalls and flexible bow and stern seals to confine a vehiclesupporting fluid cushion, at least one of said flexible seals comprising a flexible seal member positioned between said sidewalls in lateral contacting relation therewith and having upper and lower end portions, fulcrum means mounted by the hull and connected to the seal member intermediate said upper and lower end portions for accommodating pivotal displacement of the seal member about a fulcrum axis in response to cushion pressure exerted thereon, and inflatable positioning support means having separate portions engageable with the seal member adjacent the upper and lower end portions respectively on opposite sides of the fulcrum axis for balancing said cushion pressure applied and wherein said flexible seal member includes a plurality of laterally spaced stiffening rods to which the fulcrum means is connected, and flexible membrane panels supported between said stiffening rods.

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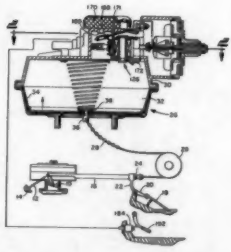
**4,422,518**

## VEHICLE SPEED CONTROL

**William A. Treadwell, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio**

**Division of Ser. No. 50,237, Jun. 20, 1979, Pat. No. 4,346,775.**
**This application Jun. 18, 1982, Ser. No. 389,655**
**Int. Cl.³ B60K *31/00***
**U.S. Cl. 180—175** **2 Claims**



1. A pneumatically operated servoactuator for controlling a vehicle throttle to regulate the vehicle speed about a selected set speed, said servoactuator comprising:

(a) a housing means defining a fluid pressure chamber including means defining a fluid pressure source port adapted for connection to a source of fluid pressure and a fluid sink port adapted for connection to the atmosphere;

(b) actuator means movably responsive to the pressures in said chamber and including an output member adapted for connection to the vehicle throttle;

(c) valve means including a member movable with respect to said source and sink port for controlling fluid pressure in said chamber, said valve means being selectively responsive to a vehicle speed sensor;

(d) circuit means defining a stationary electrical contact;
(e) dump valve means including:
(i) an auxiliary dump port in said chamber;
(ii) an elongated valve member of ferromagnetic material mounted intermediate its ends for pivotal movement with respect to said housing means, said member having a dump poppet disposed on one side of the pivotal mount for valving said dump port and a movable electrical contact means disposed on the opposite side of said pivotal mount;
(iii) means biasing said dump valve member in a direction to move said dump poppet to a position opening said dump port;
(iv) electromagnetic means operable upon actuation to magnetically attract said valve member and cause pivotal movement thereof in a direction closing said dump port with said poppet wherein said movement of said valve member causes closing of said movable electrical contact with respect to said stationary contact; wherein said circuit means employs plural paths electrically common through said pivotal mount and pole frame and through said biasing means.

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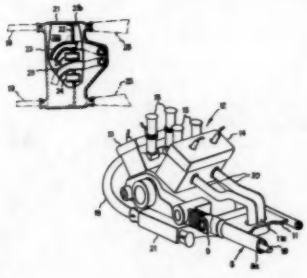
**4,422,519**

## MOTORCYCLE ENGINE EXHAUST SYSTEM

**Kazuhiko Nomura, Iwata, and Satoru Ichikawa, Hamamatsu, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan**

**Continuation of Ser. No. 78,697, Sep. 25, 1979, abandoned. This application Jan. 26, 1982, Ser. No. 343,020**
**Claims priority, application Japan, Sep. 29, 1978, 53-119181**
**Int. Cl.³ B62D** *61/02;* **F01N** *1/08, 7/08*
**U.S. Cl. 180—219** **14 Claims**



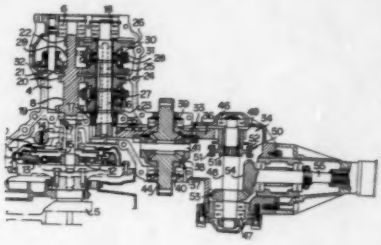
1. An engine exhaust system for a motorcycle of the type having a frame, a front and rear wheel mounted to said frame, a V type engine with at least two cylinders arranged to form a "V", and arranged forwardly and rearwardly relative to one another, said exhaust system comprising: a muffler mounted to said frame underneath said engine, said muffler having an expansion chamber, a forward exhaust pipe extending from the forwardmost cylinder forwardly and downwardly to discharge into said expansion chamber, a rearward exhaust pipe extending from the rearwardmost cylinder downwardly to discharge into said expansion chamber, and a tailpipe having a volume and a dimension of length, exhausting from said muffler, said forward exhaust pipe and tailpipe, where they respectively enter and leave said muffler, being substantially coaxial, said rearward exhaust pipe passing downwardly rearwardly of said engine and forwardly of said rear wheel.

**4,422,520**

## TRANSMISSION APPARATUS FOR FOUR-WHEEL DRIVE MOTOR VEHICLE

**Masayuki Kodama, Hachioji, and Sadao Makishima, Akigawa, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 28, 1980, Ser. No. 210,873**
**Claims priority, application Japan, Nov. 29, 1979, 54-154624**
**Int. Cl.³ B60K** *17/34*
**U.S. Cl. 180—247** **12 Claims**



1. In a transmission apparatus for a motor vehicle having an internal combustion engine disposed in said motor vehicle transversely relative to a longitudinal direction of said motor vehicle and a transmission disposed transversely relative to said longitudinal direction of said motor vehicle, said transmission being operatively connected to the crankshaft of said engine through a clutch, a differential including a final reduction gear engaged with an output gear of said transmission and a differential case secured to a side of said final reduction gear, said differential case being disposed at a substantially central region of said motor vehicle, and first transverse, wheel axles operatively connected to the differential case for being driven via the differential, the improvement comprising,

said transmission being so arranged that said output gear is positioned at a substantially central region of said motor vehicle for engaging with said final reduction gear,

a propeller shaft operatively drivingly connected to other transverse, wheel axles, said propeller shaft is oriented about a longitudinal center line of said motor vehicle,

transfer means for operatively transfering torque from said final reduction gear to said propeller shaft,

said transfer means including a supporting shaft and a gear mounted on said supporting shaft and engaged with said final reduction gear, a transfer clutch means mounted on said supporting shaft for coupling said gear with said supporting shaft, said supporting shaft being transversely disposed relative to said longitudinally direction of said motor vehicle, a first bevel gear secured on said supporting shaft, and means comprising a second bevel gear engaged with said first bevel gear for operatively driving said propeller shaft and further for driving said other transverse, wheel axles for a four-wheel drive .

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**4,422,521**

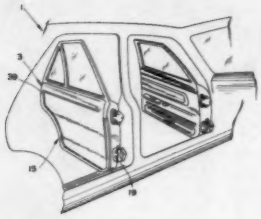
## SAFE REMOTE-CONTROL DOOR OPENING-AND-CLOSING DEVICE FOR AN AUTOMOTIVE VEHICLE

**Haruo Mochida, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Feb. 22, 1982, Ser. No. 350,876**
**Claims priority, application Japan, May 20, 1981, 56-74880**
**Int. Cl.³ B60R** *21/00;* **B60J** *5/00*
**U.S. Cl. 180—271** **10 Claims**

1. A safe remote-control door opening-and-closing device for an automotive vehicle for opening and closing a vehicle door from a remote position while protecting passengers from injury, which comprises:

(a) a door open-and-close mechanism linked to the vehicle door for opening and closing the vehicle door;
(b) a driving device linked to said door open-and-close mechanism for driving said door open-and-close mechanism, said driving device being adapted to drive said door open-and-close mechanism in a first normal direction and a second reverse direction;
(c) a door open switch connected in series with said driving device for operating said driving device in the first normal direction;



(d) a door close switch connected in series with said driving device for operating said driving device in the second reverse direction; and
(e) an abnormal sitting position detection switch for detecting that one of the passengers is in an abnormal sitting position and for preventing said driving device from driving said door open-and-close mechanism in the first normal direction in response to said door open switch and in the second reverse direction in response to said door close switch when a passenger is detected to be in an abnormal sitting position.

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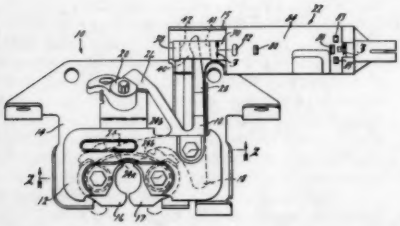
**4,422,522**

**INERTIAL LOCK FOR VEHICLE DOOR LATCH**

**Michael Slavin, Troy, and Frank J. Sherosky, Mt. Clemens, both of Mich., assignors to Lectron Products, Inc., Rochester, Mich.**

**Filed Jan. 21, 1982, Ser. No. 341,532**
**Int. Cl.³ E65B *65/16***
**U.S. Cl. 180—281** **12 Claims**



5. A locking mechanism for a vehicle door latch comprising electrical actuation means for releasing said door latch comprising a solenoid mechanism including a bobbin and a plunger movably disposed within said bobbin along an axis of movement,
means for temporarily disabling said electical actuation means by locking said plunger within said bobbin,
said disabling means being engageable with said plunger to prevent latch releasing movement thereof in said bobbin in response to inertial forces having a component of force along the axis of movement of said plunger resulting from rapid changes in the direction of movement of the vehicle and being more rapidly responsive to said inertial forces than said plunger, whereby said plunger is locked by said disabling means before said plunger has time to release said latch.

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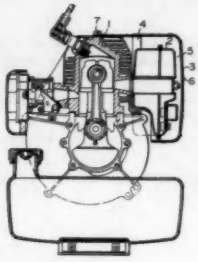
**4,422,523**

**EXHAUST MUFFLER COVER**

**Michiyasu Kuwano, Fushu, Japan, assignor to Kioritz Corporation, Japan**

**Filed Dec. 9, 1981, Ser. No. 329,088**
**Int. Cl.³ F01N *7/00***
**U.S. Cl. 181—211** **1 Claim**



1. A cover for an exhaust muffler for an internal combustion engine comprising
an exhaust muffler cover member of a thin material and disposed to substantially surround the exhaust muffler of the engine with a suitable gap therebetween;
said cover member having an outer exposed piled buffering layer consisting of short and soft fibers of an epoxy resin like material having poor heat conductivity, with said fibers being attached perpendicularly to the outer surface of said cover member;
and an attaching member fixed to an inner peripheral end of said cover member and adapted for attaching said cover member to the body of the engine, said attaching member also being a stiffening or reinforcement member.

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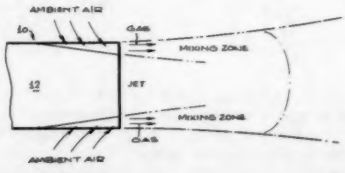
**4,422,524**

**VARIABLE SHAPE, FLUID FLOW NOZZLE FOR SOUND SUPPRESSION**

**Melvin N. Osborn, Los Angeles, Calif., assignor to Lockheed Corporation, Burbank, Calif.**

**Filed Mar. 22, 1982, Ser. No. 360,294**
**Int. Cl.³ F02K *1/12***
**U.S. Cl. 181—215** **3 Claims**




1. A variable shape and area fluid flow nozzle for aircraft jet engines, said nozzle having a longitudinal axis and being adapted for use as a sound-suppression and cruise nozzle, comprising:
a plurality of longitudinally extending peripherally spaced web elements, each of said web elements comprising an inner wall, two side walls, and an outer wall, said walls defining a passage for a portion of the gas jet emanating from said engine, and said outer wall defining a portion of the outer periphery of said nozzle;

a plurality of flaps individually and alternately interposed between pairs of said web elements and longitudinally extending from an upstream end of said nozzle to the downstream exit end of said nozzle, each of said flaps comprising a longitudinally extending gas guide vane defining the remaining portions of the outer periphery of said nozzle, each of said flaps further comprising a pair of side wall fins attached at the downstream end of and generally transverse to opposite edges of said vanes, said vanes and said fins being movable between and forming a seal with said web side walls; and

means for providing movement of said flaps from a sound-suppression/nozzle closed mode wherein said nozzle periphery is characterized by a fluted downstream cross-section and said vanes, fins and side walls provide passages for ambient air to mix into said jet immediately downstream of said nozzle exit, and a cruise/nozzle open position wherein said web outer walls and said vanes form an enlarged area-circular nozzle exit for said engine jet.

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**4,422,525**

## MUFFLER

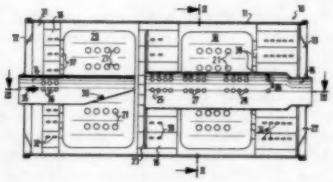
**Walter Seeger, Gaggenau, Fed. Rep. of Germany, assignor to Roth-Technik GmbH, Gaggenau, Fed. Rep. of Germany**

**Filed May 15, 1981, Ser. No. 263,995**

**Claims priority, application Fed. Rep. of Germany, May 29, 1980, 3020492**

**Int. Cl.³ F01N *1/08***

**U.S. Cl. 181—255** **18 Claims**



1. Muffler for muffling sound of combustion engines with a housing which is subdivided into at least two successive reflection chambers, an exhaust gas inlet entering a first one of said reflection chambers, intermediate channels for communication between the reflection chambers, an exhaust gas outlet pipe terminating in the last one of said successive reflection chambers, an inner side of said housing having at least one metal sheet accommodated to the curvature of said housing and having a plurality of corrugations, each corrugation and said inner side of said housing forming an intermediate channel, said exhaust gas inlet and outlet pipes having openings with regions surrounded by a respective reflection chamber, each reflection chamber forming a closed chamber and abutting the inner side of the corrugated metal sheet and forming a plurality of mutually separated guide channels, each intermediate channel having a cross-section which is smaller than the cross-section of said gas inlet pipe, the sum of cross-sectional areas of all intermediate channels being greater than the cross-sectional area of said inlet pipe, so that flow through the intermediate channels from input side to output side has substantially low flow resistance to reduce power losses and increase damping of high-frequency noise components, exhaust gas condensate forming in the muffler being transported out of the housing by the exhaust gas after a substantially short operating time.

**4,422,526**

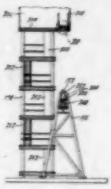
## ACCESS TOWER FOR MANUFACTURE OF TUNNEL TUBES

**Robert A. Kaucic, Newark, Del., assignor to AMCA International Corporation, Hanover, N.H.**

**Filed Apr. 23, 1981, Ser. No. 256,709**

**Int. Cl.³ E04G *1/15, 1/36***

**U.S. Cl. 182—36** **2 Claims**



1. An access tower for use in the manufacture of tunnel modules and tunnel sections for underwater tunnel tubes, said tower comprising an upstanding multi-story base structure having platform means thereon and movable bridge means for workman access from said tower to said tunnel module, said bridge means having floor means and V-shaped bridge members positioned underneath said floor means, said tower further comprising V-roller means disposed on said platform and mating with said V-shaped bridge members for supporting said bridge means, supporting frame means attached to said platform, second roller means disposed on said bridge means for gliding along said supporting frame to prevent said bridge from tipping when a workman is on the outer end thereof and stop means disposed on said supporting frame means for preventing said bridge from rolling off said tower.

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**4,422,527**

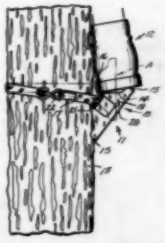
## TREE STEPS

**William E. Schultz, Okemos, and Jeffrey S. Vogl, Lansing, both of Mich., assignors to Vogl-Schultz, Incorporated, Okemos, Mich.**

**Filed Sep. 29, 1982, Ser. No. 428,195**

**Int. Cl.³ A63B *29/04***

**U.S. Cl. 182—92** **8 Claims**



1. A tree step unit comprising:

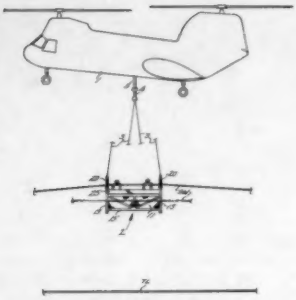
an integrally formed pyramidal nesting shell housing having a truncated platform and pair of openings therethrough substantially at the truncation and including a pair of spaced-apart feet having rounded exteriors on each end of a substantially rectangular base with two sides converging toward said platform and connected integrally to said feet; and

a belt through said openings, said belt being adjustable and lockable to hold said housing against a vertical surface and present one of said sides in a substantially horizontal load support position.

## 4,422,528
## AERIAL BASKET STRUCTURE FOR LINEMEN AND METHOD FOR UTILIZING SAME

Donald D. Patterson, Lake Oswego, Oreg., assignor to Columbia Helicopters, Inc., Portland, Oreg.

Filed Apr. 13, 1981, Ser. No. 253,901
Int. Cl.³ E04G 3/10
U.S. Cl. 182—145 2 Claims



1. An aerial basket structure for linemen and adapted for both transport of the linemen and for temporary engagement with a substantially horizontally suspended wire while the structure is slung below a helicopter, said basket structure comprising,

an enclosure within which workers are carried and including upright members to which sling lines depending from the helicopter may be attached, a pair of inclined appendages on at least one side of the enclosure extending outwardly therefrom so as to engage the suspended wire during elevation of the enclosure by the helicopter to thereby engage the enclosure with the suspended wire to enable servicing of the latter by the linemen, said upright members each including a line attachment lug with each lug adapted to receive the lower end of a sling line in a manner to facilitate uninterrupted passage of the basket structure upwardly past the suspended wire prior to engagement of the suspended wire with the appendages.

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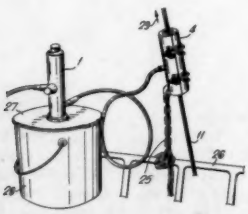
## 4,422,529
## METHOD AND APPARATUS FOR LUBRICATING STEEL CABLE

Steinar Johansen, Eiken, Norway, assignor to Masto Wireservice A/S, Kristiansand S, Norway

Filed Mar. 27, 1981, Ser. No. 248,297
Claims priority, application Norway, Oct. 6, 1980, 802958
Int. Cl.³ F16N 7/00
U.S. Cl. 184—15 R 3 Claims



1. A method of lubricating steel cables with the aid of a lubricating device including a lubricating chamber and a pair of opposed axially aligned resilient sleeve-shaped gaskets comprising the steps of supplying a liquid lubricant to said lubricant chamber from a pump at a high delivery pressure of at least 20 bar and drawing a steel cable through said lubricating chamber between said gaskets at a rate of passage selected to permit the lubricant to penetrate the cable and substantially fill the hollow spaces in the cable entering the chamber without buildup of pressure in the chamber materially above the delivery pressure thereby to avoid leakage of lubricant through said gaskets and around the cable.

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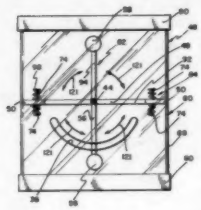
## 4,422,530
## PENDULUM STRUCTURE

Cleo E. Denton, 1026 S. Richmond, Wichita, Kans. 67213

Filed May 8, 1981, Ser. No. 261,962
Int. Cl.³ F03G 3/06
U.S. Cl. 185—29 3 Claims



1. A pendulum structure, comprising;

(a) a housing assembly;

(b) a pendulum assembly having a pendulum member pivotally connected to said housing assembly for swinging movement therein;

(c) an actuator assembly connected to said housing assembly having a bias member engagable with said pendulum member to impart energy thereto to aid in said swinging movement;

(d) said pendulum member being a dual pendulum member includes a main body having a head member secured to outer ends thereof;

(e) said main body pivotally connected to said housing assembly at a central portion thereof;

(f) said actuator assembly having a plurality of bias members engagable with respective ones of said head members; and

(g) said head members concurrently engagable with respective ones of said bias members at the same time to receive from and impart energy to said head members.

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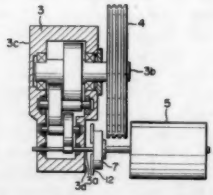
## 4,422,531
## TRACTION MACHINE FOR AN ELEVATOR

Sadayuki Ohtomi; Yasutaka Hirano; Iturou Tangiku, and Tamaiti Kondou, all of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1981, Ser. No. 259,609
Claims priority, application Japan, Jun. 2, 1980, 55-76504
Int. Cl.³ B66B 11/04
U.S. Cl. 187—20 6 Claims



3. A traction machine for an elevator, said traction machine comprising:

a reduction gear mechanism including a main housing having therein parallel axis gears, an input shaft and an output shaft extending parallel to said input shaft;

a traction sheave connected to said output shaft;

a brake drum secured as a shaft coupling to said input shaft at the side of said main housing on which said traction sheave is disposed;

an electric motor having a shaft, said electric motor being disposed such that a peripheral portion of the shaft side end surface of said electric motor confronts a peripheral portion of one side surface of said traction sheave; and

said shaft of said electric motor being connected to said input shaft through a plate-like connector means secured to a projecting end of said shaft of said electric motor and to said brake drum, the distance from a longer side of said plate-like connector means, elongated in a direction orthogonal to the longitudinal direction of said shaft of said electric motor, to the center of said shaft of said electric motor being selected to be less than the distance from the peripheral surface of said traction sheave to said center of said shaft of said electric motor.

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**4,422,532**

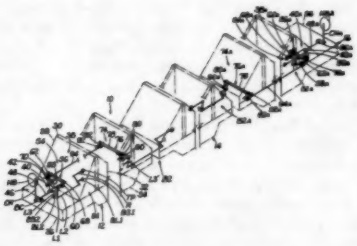
## HAND BRAKE MECHANISM INCLUDING FORCE DIVIDING ASSEMBLY

**Eugene J. Cordani, Florissant; James C. Hammonds, St. Charles, and Frederick E. Vorwerk, St. Peters, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.**

**Filed Jun. 11, 1981, Ser. No. 272,599**

**Int. Cl.³ B61H *13/00***

**U.S. Cl. 188—47** **24 Claims**



1. Mechanism for applying a brake force to a first set of brakes acting on a first set of wheels at a first end of a railway car and to a second set of brakes acting on a second set of wheels at the other end of the car; the first set of brakes being located on the opposite side of the car from the second set of brakes, and the brake force being produced by a manually operable hand wheel, the mechanism comprising: force splitting means interconnected with the hand brake for transmitting the brake force produced by operation of the hand brake to the first set of brakes; first torque means interconnected with the force splitting means for transferring the brake force produced by operation of the hand brake to the opposite end of the car; and second torque means interconnected with the first torque means for transferring the brake force transversely across the car to the second set of brakes whereby the first and second sets of brakes are applied to their respective sets of wheels to prevent movement of the car.

**4,422,533**

## SEALING MEANS FOR HYDRAULIC BRAKE ACTUATORS

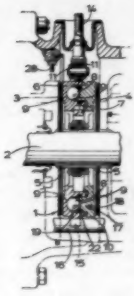
**Anthony G. Price, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England**

**Filed Jul. 10, 1981, Ser. No. 282,080**

**Claims priority, application United Kingdom, Jul. 10, 1980, 8022677**

**Int. Cl.³ F16D *55/20*; F16J *15/32***

**U.S. Cl. 188—71.4** **3 Claims**



1. An hydraulic brake actuator comprising a brake housing having end faces, a rotatable shaft extending through said housing, brake discs rotatable with said shaft for engagement with said end faces, and a pair of pressure plates which are adapted for relative axial and angular movement to urge said brake discs into engagement with said end faces of said brake housing, an annular piston member provided in one of said plates, an annular cylinder member provided in an adjacent face of the other of said plates and having a bore surrounding an axis in which said piston is adapted to work, means defining a first seal-receiving groove in the outer surface of said piston, a first annular seal located in said first groove for engagement with the outer face of said cylinder, a second means defining a second seal-receiving groove in the inner face of said cylinder, a second annular seal located in said second groove for sealing engagement with the inner face of said piston, and a high pressure space defined in said cylinder between a wall defining a closure for the inner end thereof and the inner end of said piston, wherein each said seal in an unstressed condition is substantially of triangular outline having three main faces, and each said seal-receiving groove is defined between first and second end walls with which two of said main faces of said seal are in full facial contact, said end walls being relatively inclined, at least said second end wall also being inclined with respect to said axis of said cylinder, and the relative lengths of said faces and said end walls being so chosen that a sealing region of said seal defined by and between the third remaining one of said faces and the one of said two faces which in contact with said first end wall is in sealing engagement with the said other member, and a space is defined between said second end wall and the said third face to accommodate any deformation of the material of said seal which is otherwise confined between said walls of the groove and the said other member, the space being disposed at ends of said seals which are adjacent to said high pressure space whereby to enhance said facial contact of said faces of said seal and said end walls.

4,422,534

## DISC BRAKE

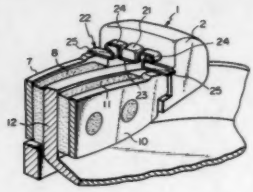
Harumi Oshima, Kawasaki, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Continuation of Ser. No. 207,432, Nov. 17, 1980, abandoned. This application Jan. 10, 1983, Ser. No. 456,726

Claims priority, application Japan, Nov. 20, 1979, 54-160716[U]; Nov. 20, 1979, 54-160718[U]

Int. Cl.³ F16D 55/224

U.S. Cl. 188—73.38 22 Claims



1. In a disc brake of the kind including a stationary member securable to a non-rotatable part of a vehicle and having first and second arms spaced along and extending across the circumference of a disc which is rotatable about an axis of rotation, a caliper slidably supported on the stationary member, a pair of friction pads slidably supported on opposing walls of the respective first and second arms, a brake actuator provided on one side of the disc for pressing one of the pair of friction pads against the one side of the disc and slidably displacing the caliper on the stationary member, thereby pressing the other one of the pair of friction pads against the other side of the disc, the improvement comprising:

the opposing walls of the first and second arms having outwardly facing shoulders for supporting circumferentially opposite ends of the pair of friction pads, the opposing wall of the first arm and the opposing wall of the second arm respectively having first and second projections opposing and extending toward each other located radially outward of the circumference of the disc;

first and second pad springs respectively integrally formed by bending separate elongated members in corresponding planes and respectively having first and second generally U-shaped central portions in said planes; each of said first and second pad springs having first and second pressing portions extending in a corresponding one of said planes continuously in directions parallel the axis of rotation of the disc from opposing sides of said first and second central portions so as to press the pair of friction pads radially inwardly toward the axis of rotation of the disc and against said shoulders, and having first and second resilient portions bent in the corresponding one of said planes respectively joining said first and second pressing portions; said first and second central portions each including spaced generally radially extending first and second side walls having radially outward ends and radially inward ends formed in the corresponding one of said planes and a base portion having a radially outward facing surface, formed in the corresponding one of the planes connecting said radially inward ends; said first and second resilient portions of said first and second pad springs being joined to said first and second central portions at said outward ends; said first and second projections extending between said first and second side walls of said first and second central portions on said radially outward surface of said base portion so that said first and second central portions of said first and second pad springs are respectively retained by said first and second projections at least in the direction radially outwardly away from the axis of rotation of the disc.

4,422,535

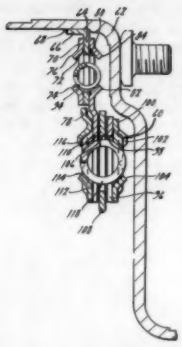
## COMPOUND DAMPER ASSEMBLY FOR AN AUTOMATIC TRANSMISSION

Ching-Chung Ling, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 20, 1981, Ser. No. 265,496

Int. Cl.³ F16D 3/66

U.S. Cl. 192—3.28 10 Claims



1. In a hydrokinetic torque converter transmission adapted to deliver driving torque from an internal combustion engine to a drive shaft including a hydrokinetic torque converter having an impeller connected to said engine, a multiple ratio gear system having an output gear element connected to said drive shaft, said converter having a turbine connected to torque input elements of said gear system, and a mechanical torque delivery path in parallel relationship with respect to said hydrokinetic converter for establishing a mechanical torque flow path that is independent of the hydrokinetic torque flow path of the hydrokinetic converter;

said torque flow path comprising a damper assembly having a first damper plate connected to said impeller, a torque delivery shaft connected to an input element of said gear system, a torque output plate in said damper assembly, an intermediate damper plate in said damper assembly located between said first and second damper plates;

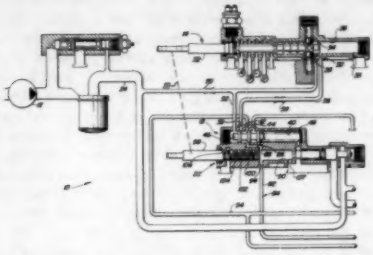
a first set of damper springs in said damper assembly establishing a yieldable spring connection between said first damper plate and said intermediate damper plate, and second and third sets of damper springs arranged in parallel disposition one with respect to the other and establishing a yieldable spring connection between said intermediate damper plate and said output damper plate, said first spring set being arranged in series disposition with respect to one of the other two sets of springs whereby said damper assembly is characterized by three characteristic operating stages including a first stage in which one set of springs of said other set acts in series relationship with said first set to establish a relatively low spring rate, a second characteristic operating stage wherein said one set of said other sets of springs establishes a spring damping force and a third characteristic operating stage wherein said second and third sets of springs act in parallel relationship in unison with the first series of springs inactive thereby establishing a final damper spring rate of high magnitude.

4,422,536

## TRANSMISSION CONTROL SYSTEM WITH IMPROVED MODULATION RATE REGULATING VALVE

Lawrence A. Shatuck, White Heath, Ill., assignor to Deere & Company, Moline, Ill.

Filed May 8, 1981, Ser. No. 261,844
Int. Cl.³ B60K *41/00*
U.S. Cl. 192—3.57 5 Claims



1. A hydraulic transmission control system for selectively actuating at least one of a plurality of speed friction devices and for selectively actuating one of a plurality of direction-friction devices, comprising: a fluid source; a speed-selector valvve connected for communicating the source to one of the speed friction devices; a direction-selector valve connected for communicating the source to one of the direction-friction devices; a hydraulically responsive pressure-modulating valve connected in fluid communication with the direction-selector valve for modulating the fluid communicated to the direction-selector valve from the source; said modulating valve including a valve element and a pressure-regulating spring biasing the valve element in a first direction and a piston engaged with the spring and shiftable in the first direction for increasing the resistance of the pressure-regulating spring to movement of the valve element in a second direction opposite to the first direction; a source of increasing fluid pressure directed along a fluid path leading to the piston for shifting the latter in the first direction; and an orifice-selector valve located in the fluid path and connected to the speed-selector valve for being operated concurrently with the latter for disposing a different orifice of a selected size in the fluid path for each speed position of the speed-selector valve to thereby regulate the rate that the source of increasing fluid pressure is communicated to the piston and thus, to thereby control the rate of movement of the piston in the first direction and hence, the rate of increase in the pressure of the fluid controlled by the modulating valve.

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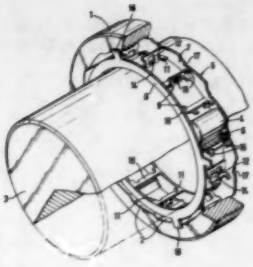
4,422,537

## ONE PIECE SHEET METAL CAGE

Joachim Ritter, and Ernst Neuwirth, both of Herzogenaurach, Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Jun. 19, 1981, Ser. No. 275,289
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023687
Int. Cl.³ F16D *41/06*
U.S. Cl. 192—45 5 Claims

1. A one-piece sheet metal cage for an overrunning roller clutch wherein the cams rollers roll between a smooth inner races and an outer race provided with camming surfaces comprising a U-shaped sheet metal element provided in its longitudinal section with radial ends of different height, the higher end engaging the camming surfaces in a locking manner with a corresponding outer profile and the cage is provided with folding springs on radially directed segments on the cross-bars forming the cage pockets which cause the cam rollers to bear against an inner and outer retaining element of an adjacent cross-bar, each said cross-bar comprising a short segment extending in the circumferential direction at the bottom of the U-profile which forms the inner retaining elements at its axial ends adjoining the end flanges connecting the cross-bars and a flap between the inner retaining elements bent radially outward to which is secured a folding spring engaging an opening of the flap with an elastic projection, said flap being provided at its two axial ends with bent outer retaining lugs.



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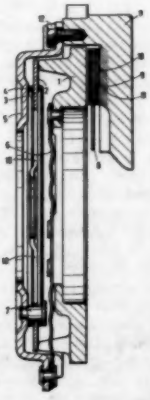
4,422,538

## FRICTION CLUTCH, ESPECIALLY FOR MOTOR VEHICLES

Klaus-Dieter Krumm, Bühl, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Oct. 18, 1979, Ser. No. 86,138
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1978, 2845855
Int. Cl.³ F16D *13/70*
U.S. Cl. 192—70.14 12 Claims



1. In a friction clutch, the combination of a first component including a pressure plate; a second component at one side of said first component; a friction disc between said components; and means for biasing said first component toward said friction disc, said first component consisting of finely striped pearlitic cast iron containing less than 5 percent free ferrite and laminar graphite finer than 3 in size according to VDG specification P441, at least one of said components containing between 0.16 and 0.3 percent by weight of titanium.

## 4,422,539
## CLUTCH DISK

**Karl-Heinz Werner, Schweinfurt, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany**

**Filed Dec. 5, 1980, Ser. No. 213,626**
**Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951573**
**Int. Cl.³ F16D *13/69***
**U.S. Cl. 192—107 C** **6 Claims**

1. In a clutch disk, particularly for a motor vehicle clutch, comprising:

(a) a carrier disk having an axis, a circumferentially extending radially outer edge, and a peripheral zone spaced radially outwardly from and extending around said axis with said peripheral zone located adjacent to said outer edge of said carrier disk;

(b) a plurality of pairs of leaf spring elements, said pairs being distributed in the circumferential direction along and fixed to said peripheral zone and extending radially outwardly therefrom;

(aa) said leaf spring elements of each said pair of leaf spring elements comprising a radially inner fixing portion, a radially outer lining carrying portion and a neck portion connecting said fixing portion and said carrying portion;

(bb) said fixing portions of said leaf spring elements of each said pair of leaf spring elements having an assembled condition and a disassembled condition and in the assembled condition said leaf spring element of each said pair resting against each other in the axial direction and being commonly fixed to said peripheral zone;

(cc) the lining carrying portion (3*b*) of said leaf spring elements (3) of each said pair of leaf spring elements having an uneven configuration as compared with a plane normal to said axis such that only first partial areas of said lining carrying portions abut each other whereas second partial areas of said lining carrying portions are spaced from each other in the axial direction when in the unloaded condition;

(c) friction linings (7) fixed to oppositely directed front faces of said lining carrying portions of the leaf spring elements of each said pair of leaf spring elements within said second partial areas;

the improvement which consists in that in the disassembled condition the lining carrying portion and the fixing portion of said leaf spring elements of each said pair of leaf spring elements are inclined with respect to each other—as seen in a section plane containing said axis of the disk, said inclination being substantially overcome in the assembled condition so as to elastically press said lining carrying portions of the leaf spring elements of respective pairs of leaf spring elements against each other in said first partial areas, pulling members are provided between said lining carrying portions of the leaf spring elements of each said pair of leaf spring elements in said second partial areas, said pulling members being under pulling tension, said pulling tension generating an additional pressure between said lining carrying portions of the leaf spring elements of respective pairs of leaf spring elements in said first partial areas, said pulling members are formed as rivets fixing said friction linings to said lining carrying portions, one first pulling member fixes by a first end thereof a first friction lining to the lining carrying portion of a first leaf spring element of each said pair of leaf spring elements, a second end of said first pulling member engaging the lining carrying portion of a second leaf spring element of each said pair of leaf spring elements at the outer front face of said second leaf spring element remote from said first leaf spring element and being axially movable with respect to the lining carrying portion of said second leaf spring element, and wherein at least one second pulling member fixes by a first end thereof a second friction lining carrying portion of said second leaf spring element of each said pair of leaf spring elements, the second end of said second pulling member engaging the lining carrying portion of said first leaf spring element of each said pair of leaf spring elements on the outer front face of said first leaf spring element remote from said second leaf spring element and being axially movable with respect to the lining carrying portion of said first leaf spring element, each said lining carrying portion of said leaf spring elements of each said pair of leaf spring elements comprise—when regarded in radial direction with respect to said axis, a centrally arranged said first partial area, and laterally arranged second partial areas on both circumferentially spaced sides of said central first partial area, and laterally arranged said first partial areas on the sides of said lateral second partial areas spaced circumferentially remote from said central first partial area, said lateral second partial areas being substantially arc-shaped, each said lining carrying portion is symmetrical relative to said centrally arranged first partial area thereof.

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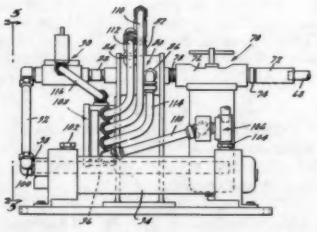
## 4,422,540
## CLUTCH/BRAKE UNIT WITH MODULAR HEAT EXCHANGER

**Gordon M. Sommer, Boca Raton, Fla., assignor to Sommer Co., Warren, Mich.**

**Filed Mar. 27, 1981, Ser. No. 248,304**
**Int. Cl.³ F16D *13/72***
**U.S. Cl. 192—113 B** **8 Claims**



1. A heat exchange apparatus for use with an oil-cooled clutch/brake unit or the like, comprising

cooling fluid;

means for exchanging heat to said cooling fluid from oil from said unit passing through said apparatus;

inlet and outlet conduit means to said heat exchanging means for said cooling fluid;

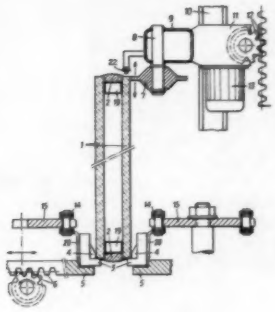
means for sensing the temperature of oil entering said apparatus; and

means for controlling the flow of said cooling fluid, including means for controlling the flow of said cooling fluid in response to the temperature of the oil sensed by said sensing means.

## 4,422,541
## APPARATUS FOR CONVEYING INSULATING GLASS PANES

Peter Lisec, Bahnhofstrasse 34, Amstetten-Haunmening, Austria

Filed Jul. 9, 1981, Ser. No. 281,706
Claims priority, application Austria, Sep. 22, 1980, 4725/80
Int. Cl.³ B65G 15/14
U.S. Cl. 198—627 9 Claims



1. In apparatus for conveying insulating glass panes comprising each two spaced apart individual glass panes, which define grooves at the edges of said insulating glass panes, which grooves are filled with a sticky sealing compound, said apparatus being operable to convey said insulating glass panes with an inclination from the vertical along a predetermined path so that each of said individual glass panes has a lower edge face, an upper edge face, an outside surface, and an outer upper edge between said upper edge face and said outside surface,

the improvement residing in that

a plurality of pairs of mutually opposite rigid supports disposed on opposite sides of said path are provided and are spaced apart along said path and movable along the same,

drive means for moving said pairs of supports in unison along said path are provided,

the supports of each of said pairs are adapted to engage the lower edge faces of respective individual glass panes of each of said insulating glass panes only in an outer portion of said lower edge faces,

backing means disposed on one side of said path and spaced above said supports and adapted to engage one of said individual glass panes of each of said insulating glass panes on its outside surface,

two parallel guide rails which are spaced below said rigid supports and engage the latter from below,

said drive means comprising two parallel endless conveyor elements disposed on opposite sides of said path,

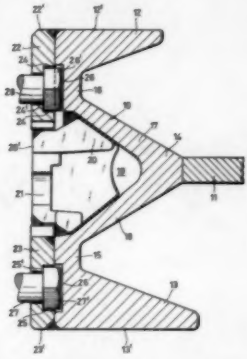
the supports disposed on each side of said path being secured to the adjacent said conveyor element,

the supports of each of said pairs carrying respective pressure contact jaws having substantially vertical pressure contact surfaces facing each other and adapted to resiliently engage respective individual glass panes of each of said insulating glass panes on said outside surfaces close to said lower edge face, and means to cause said pressure contact jaws to apply pressure resiliently to said outside surfaces, said pressure contact jaws cooperating resiliently with said rigid supports to maintain said lower edge faces of said panes on said rigid supports with said rigid supports out of contact with said sticky sealing compound.

## 4,422,542
## SCRAPER-CHAIN CONVEYORS

Helmut Temme, Waltrop, and Erwin Beckmann, Kamen-Methler, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Continuation of Ser. No. 152,682, May 23, 1980, abandoned.
This application Jul. 23, 1982, Ser. No. 401,315
Claims priority, application Fed. Rep. of Germany, May 26, 1979, 2921412
Int. Cl.³ B65G 19/28
U.S. Cl. 198—735 10 Claims

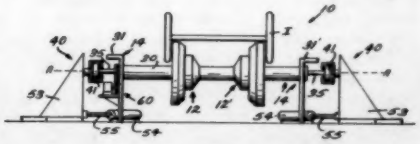


1. A conveyor channel section or pan comprising side walls, each with a generally sigma-shaped profile adjoined by a floor plate, each side wall having a central V-shaped groove in its exterior and upper and lower upstanding web portions adjacent said groove, reinforcement bars extending longitudinally of the pans, said bars being welded alongside the exteriors of the web portions of at least one of the side walls, apertures in the bars from which extend the shanks of bolts used to secure attachments to the pan, the inner faces of said bars having relieved portions along the margins of said apertures, and recesses in the exterior faces of the web portions of said at least one side wall behind the apertures, said recesses cooperating with said relieved portions to jointly define pockets in which the heads of said bolts are removably retained.

## 4,422,543
## UNIVERSAL CONVEYOR

James H. Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Filed Jan. 3, 1979, Ser. No. 910
Int. Cl.³ B65G 13/00
U.S. Cl. 198—782 18 Claims



1. A conveyor roller comprising a generally tubular body member of hard rubber, including means defining an axial more extending through the body member; a radially outermost generally axially extending peripheral surface; a generally radially extending first end surface; a generally radially extending second surface; a radially innermost generally axially extending peripheral surface; and a radially slanting outer surface; said radially outermost generally axially extending peripheral surface extending between said first surface and said

radially slanting surface, and said second surface extending between said radially slanting surface and said radially innermost generally axially extending peripheral surface; key means formed on the interior of said axial bore, and including a metal sleeve, said metal sleeve having an axially extending abutment surface formed on the opposite side of said radially slanting outer surface as said radially outermost generally axially extending surface.

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**4,422,544**

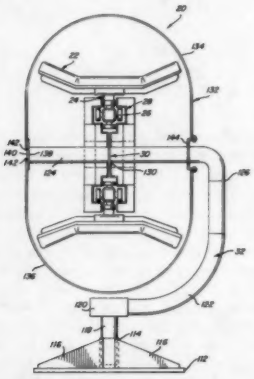
**CONVEYOR SYSTEM WITH BI-PLANAR CHAIN**

**Robert L. Alldredge, 130 Pearl St., Denver, Colo. 80203**

**Filed May 18, 1981, Ser. No. 264,632**

**Int. Cl.³ B65G** *15/60*

**U.S. Cl. 198—838** **7 Claims**



6. An improved conveyor system of the type employing and endless conveyor belt capable of following a path having vertical and horizontal curves along the course of travel while supporting a load from below the load, the conveyor system including a track arranged for establishing a selected course of longitudinal travel for the belt, a belt moving means having (1) a pulling chain adapted to be moved along the course of travel defined by said track, and (2) belt carriage means joined to the pulling chain at selected intervals and extending from the chain to the belt for supporting the belt from below the belt, wherein the improvement comprises: a support leg structure having

(a) a base capable of supporting the conveyor against an underlying surface;

(b) a conveyor support bar having a free end and an opposite end attached to said base, the bar extending transversely to the longitudinal course of the conveyor and carrying said track;

(c) means intermediate the base and support bar for selectively adjusting the vertical height of the support bar relative to the base;

(d) means intermediate the base and support bar for selectively adjusting the horizontal position of the support bar relative to the base; and

(e) means intermediate the base and support bar for selectively adjusting the relative angle of rotation between the support bar and base.

**4,422,545**

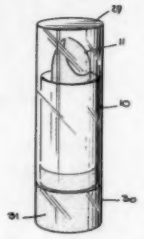
**COSMETIC DISPLAYER AND DISPENSER**

**Shlomo J. Kadoory, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.**

**Filed May 17, 1982, Ser. No. 379,248**

**Int. Cl.³ A45D** *40/06;* **B65D** *51/28, 65/16*

**U.S. Cl. 206—45.34** **2 Claims**



1. A cosmetic displayer and dispenser having a holder assembly adapted to hold a first cosmetic, a cover and a base, the improvement comprising, said base being constructed of transparent material and fillable with cosmetic.

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**4,422,546**

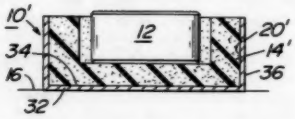
**SOAP DISH**

**Betty Charity, 8036 Lincoln Dr., Jessup, Md. 20794**

**Filed Aug. 10, 1982, Ser. No. 406,903**

**Int. Cl.³ A47K** *5/08, 7/02;* **A47L** *13/46;* **B43L** *21/00*

**U.S. Cl. 206—77.1** **9 Claims**



1. A soap dish for releasably holding a bar of soap comprising a soap retaining member adapted to releasably contain a bar of soap therein, said soap retaining member being formed of an aqueous absorbing composition which may be compressively deformed subsequent to said aqueous absorption for removal of liquid contained therein, said soap retaining member including a lower surface having a liquid impervious layer formed thereon, said liquid impervious layer being resilient.

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**4,422,547**

**CONTAINER FOR HOLDING SUBSTRATE**

**Nobutoshi Abe, Kawasaki; Yukio Kakizaki, Yokohama, and Jiro Kobayashi, Yamato, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Nov. 29, 1982, Ser. No. 445,030**

**Int. Cl.³ B65D** *85/30, 81/02;* **H01N** *13/54*

**U.S. Cl. 206—328** **5 Claims**

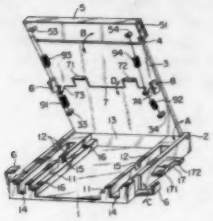
1. A container for containing therein a planar substrate, said container comprising:

(a) housing means provided with an opening which said substrate can pass through in the direction substantially parallel to the plane of said substrate, and with an inner space for receiving said substrate;

(b) door means attached to said housing means for closing said opening, said door means being movable to open said opening; and

(c) fixing means for fixing said substrate received in said inner space to said housing means, said fixing means including a contact member movable within said inner space of housing means, and means for moving said contact member and

operable in link with the motion of said door means in such manner that when said opening is closed by said door means,



said contact member is brought into contact with said substrate and when said opening is opened, said contact member is retracted from said substrate.

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**4,422,548**

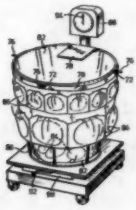
## SURGICAL SPONGE COUNTER AND BLOOD LOSS DETERMINATION SYSTEM

**Barbara E. Cheesman, Cornwall, and Raza Alikhan, Oakville, both of Canada, assignors to Ritmed Limited**

**Filed Jan. 18, 1982, Ser. No. 340,261**

**Int. Cl.³ A61B** *19/00;* **A61F** *13/00;* **B65D** *30/22, 85/00;* **G01G** *19/00*

**U.S. Cl. 206—370** **8 Claims**



1. A system for collecting, containing, counting, weighing and disposing of soiled sponges from surgical procedures, comprising:

means for suspending and retaining a disposable receptacle into which said soiled sponges may be placed directly from the field of operation;

a strip of thermoplastic material having a plurality of pouches formed therein, each pouch having front and rear walls and having a top, a bottom and a pair of opposed sides; the front and rear walls of each pouch being securely sealed one to the other at the bottom and at least one side thereof, and having a substantially horizontal opening between said front and rear walls at its top side; said plurality of pouches being contiguous one to another at at least one adjoining pair of sides, or at a respective top and bottom of adjoining pouches;

and means for suspending said strip of thermoplastic material from its top edge; and means for weighing at least said receptacle, said strip of thermoplastic material, said suspending means and any soiled surgical sponges contained in said pouches.

**4,422,549**

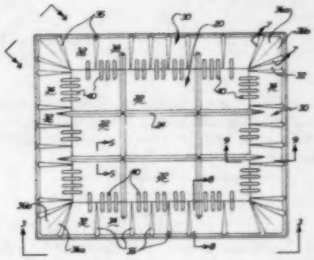
## APPARATUS FOR STABILIZING LAYERS OF NEWSPAPERS ON A MOVABLE PALLET

**James S. Werkheiser, Nazareth, Pa., assignor to Harris Graphics Corporation, Melbourne, Fla.**

**Filed Mar. 23, 1981, Ser. No. 246,731**

**Int. Cl.³ B65D** *19/24*

**U.S. Cl. 206—386** **6 Claims**



1. A separator sheet for disposition between horizontally oriented layers of newspaper bundles on a movable pallet, said separator sheet having a central portion and an outer portion circumscribing the central portion, the outer portion including first inclined walls extending upwardly from the central portion at acute angles thereto and for bearing against the bottom surfaces of the outer bundles of the layer of newspaper bundles above the separator sheet to support said outer bundles of said layer of newspaper bundles and for exerting forces against the outer bundles of the layer for resisting horizontal movement of the newspaper bundles above the separator sheet, the outer portion of said separator sheet further including second inclined walls extending downwardly from the central portion at an acute angle thereto and which bear against the top surfaces of the outer bundles of the layer of newspaper bundles below the separator sheet for exerting forces against the outer bundles of the layer of newspaper bundles below the separator sheet for resisting horizontal movement of the newspaper bundles below the separator sheet, said central portion being disposed generally in a central reference plane, said first inclined walls being disposed in planes extending upwardly from the central reference plane at acute angles thereto, said second inclined walls being disposed in planes extending downwardly from the central reference plane at acute angles thereto, said first and second inclined walls being alternately disposed about the central portion of the separator sheet with adjacent first and second inclined walls extending in opposite directions from said central reference plane, and said outer portion further including side walls extending through the central reference plane and interconnecting adjacent first and second inclined walls.

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**4,422,550**

## STRUCTURE OF PIVOTAL-SHAFT RECEIVING HOLE OF THIN-WALLED MOLDING PRODUCT

**Masatoshi Okamura, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan**

**Filed Jul. 2, 1981, Ser. No. 279,798**

**Claims priority, application Japan, Aug. 4, 1980, 55-109777**

**Int. Cl.³ B65D** *85/672*

**U.S. Cl. 206—387** **2 Claims**

1. A pivotal shaft receiving member, comprising:

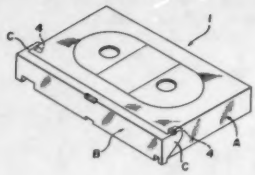
a one piece molded product including a portion having a first thickness;

a boss formed on one surface of said portion of said product;

a bore for a pivotal shaft, said bore having walls defined by

said portion and said boss, the depth of said bore being greater than said first thickness; and

a pivotal shaft positionable in said bore, said pivotal shaft



having a length greater than said first thickness and less than said depth of said bore, wherein said molded product comprises a magnetic tape cassette and wherein said shaft is fixed to a cover for said cassette.

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**4,422,551**

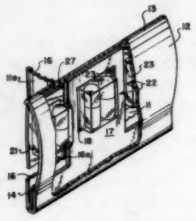
**BLISTER PACKAGE DISPENSER**

**Thomas D. Pawlowski, Neenah, Wis., assignor to James River-Dixie/Northern, Inc., Norwalk, Conn.**

**Filed Dec. 2, 1981, Ser. No. 326,756**

**Int. Cl.³ B65D *75/00***

**U.S. Cl. 206—461** **10 Claims**



1. An improved dispensing package structure for a strip of severable blister package units, comprising:

a generally flattened end-accessible sleeve of flexible and resilient material;

a planar panel of like flexible and resilient material retained along a first edge thereof within said sleeve and having a free edge opposite said first edge free to move within said sleeve, said planar panel being in substantially coplanar relation with a confronting inner surface portion of the flattened sleeve, said panel having a window portion, the strip of severable blister package units being inserted within said sleeve through an end thereof between said planar panel and said confronting inner surface portion by deflecting said planar panel away from said inner surface portion and inserting said strip until the blister portion of at least one of said units aligns to project through said window, whereby the resilient planar panel resumes its undeflected planar shape for releaseably retaining the strip within the sleeve by the interaction of said window and said aligned blister portion of said package units.

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**4,422,552**

**CARD FOR MOUNTING BAGS AND THE LIKE**

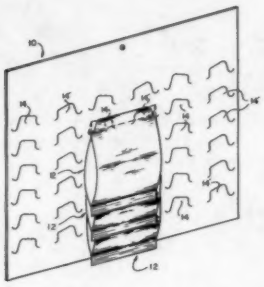
**Charles E. Palmer, Somers, and William A. Gelinas, Enfield, both of Conn., assignors to Palmer Systems, Inc., Somers, Conn.**

**Filed Jun. 7, 1982, Ser. No. 385,881**

**Int. Cl.³ G09F *1/02*; B65D *73/00***

**U.S. Cl. 206—466** **15 Claims**

1. In a card for disengageably mounting a product-containing bag having a reversely-foldable, generally rectangular outer flange thereon, the improvement comprising: a coacting pair of locking tabs formed in said card by substantially identical mirror-image cut scores, each tab of said pair being hingedly connected to the remainder of said card along a lower portion thereof, and being defined by inner, upper and outer edge portions, said inner edge portion extending upwardly from the inner end of the hinge to said upper edge portion, and said outer edge portion extending downwardly and outwardly from said upper edge portion toward the outer end of said



hinge, said outer edge portions of said tabs being spaced from one another a distance substantially equal to or less than the width of the bag flange, so that said tabs can be displaced forwardly from the plane of said card to receive the folded flange of a bag thereover with its outer end portions extending therebeyond, and can thereafter be forced back through said plane, with the bag carried thereon, to cooperatively engage the outer flange portions behind said card to securely mount the bag.

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**4,422,553**

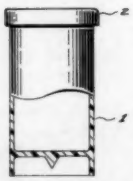
**TABLET SPLITTING DEVICE**

**Harold L. Hoeks, 3295 West River Rd., N.W., Grand Rapids, Mich. 49503, and Donald D. Robinson, 1950 Hall St., S.E., Grand Rapids, Mich. 49506**

**Filed Sep. 17, 1982, Ser. No. 419,441**

**Int. Cl.³ B26F *3/00*; B65D *85/56***

**U.S. Cl. 206—528** **11 Claims**

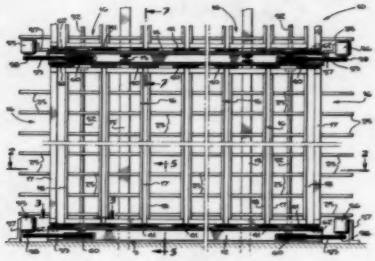


1. A tablet splitting pharmaceutical container comprised of a main body of the container and a removable cap of the container used for the storage of pharmaceutical tablets, wherein the improvement comprises an incorporation of a tablet splitting device into the physical configuration of the container whose elements constitute: a physical cutting edge used to split whole tablets into portions; and, physical cavities adjacent to the cutting edge used to capture the split tablet portions with the container-device.

## 4,422,554
## MECHANIZED RETRIEVABLE HORIZONTAL STORAGE RACK

Robert D. Lichti, 3318 Warwood Rd., Lakewood, Calif. 90712

Filed Jul. 1, 1981, Ser. No. 279,432
Int. Cl.³ A47F 3/08
U.S. Cl. 211—1.5 23 Claims



1. A mechanized rack assembly comprising a horizontally elongated stationary frame, a storage train comprising a multiple number of vertically elongated traveling frames including link means for movably linking said traveling frames together in the form of an endless chain of such traveling frames, said stationary frame including a horizontally extending support for traveling frames of said chain extending along sides and around ends of the stationary frame, and a rolling support on each traveling frame adapted to ride on said horizontally extending support, a motor having an operating drive connection with said chain, each traveling frame comprising a stack of storage stations of selected horizontal breadth and depth comprising a multiple number of vertically spaced outwardly open trays for reception thereon of storage items, said operating drive connection and said chain being adapted to be halted with a selected one of said stacks and its trays in a delivery position at one end of the stationary frame with trays open outwardly for removal and loading of storage items, the horizontal distance between stacks in back to back relationship on opposite sides of said endless chain of traveling frames being less than the horizontal depth of said stacks.

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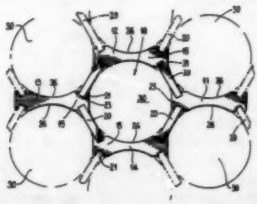
## 4,422,555
## RACKING

Keith R. Jacobs, Ferny Creek, Australia, assignor to Linton James Kirk, Aspendale, Australia

Filed Jun. 25, 1981, Ser. No. 277,342
Int. Cl.³ A47F 7/28
U.S. Cl. 211—74 11 Claims



1. A modular rack for storing wine bottles comprising a honeycomb of elongate cellular enclosures each arranged to accommodate a wine bottle, the honeycomb being defined by elongate support members each of which includes an upper elongate surface and a lower elongate surface, each longitudinal edge of at least one end of the support member having formed therein a pair of obliquely extending slots, the slots opening adjacent or on the edge of said respective upper and lower surfaces, the elongate suppport members being joined together by struts which extend between two adjacent support members and have ends that locate within the slots of adjacent support members so that the struts are inclined to the plane of the support members.

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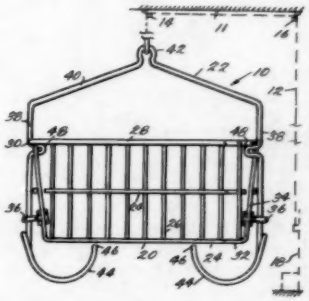
## 4,422,556
## RECEPTACLES FOR OVERHEAD STORAGE SYSTEMS

Junius T. Moore, Charleston, W. Va., assignor to The Moore Company, Inc., Charleston, W. Va.

Filed Feb. 2, 1981, Ser. No. 230,643
Int. Cl.³ A47F 7/00
U.S. Cl. 211—119 7 Claims



1. An improved receptacle for storing articles and hanging clothing, the receptacle being used in a changeroom system having means for moving the receptacle between a lowered position of accessibility and an elevated position of inaccessibility, said receptable comprising:

a basket member for storing articles;

a bail-like handle member of substantially inverted U-shaped configuration for attachment to said means for moving the receptacle, said bale-like handle member having a pair of parallel arms extending downwardly on opposite sides of said basket member and each of said arms carrying at its lower end at least one inwardly turned U-shaped clothes supporting hook member having a free end extending upwardly beneath and towards said basket member, said basket member being movable relative to said bail-like handle member between a lower position and an upper position;

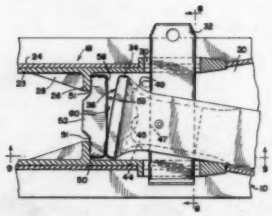
eye bolts carried by said basket member on opposite sides thereof for receiving said parallel arms therethrough to guide the same when said bail-like handle member is moved relative to said basket member; and

basket support means positioned on said parallel arms and spaced upwardly of said U-shaped clothes carrying hooks for directly receiving a load from said basket member and transferring it directly to said parallel arms when said basket member is in the lower position relative to said bail-like handle member whereby the free ends of said hook members extending beneath said basket member are load free.

## 4,422,557
## ALIGNING DRAWBAR

Russell G. Altherr, Munster, Ind., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Continuation of Ser. No. 202,561, Oct. 31, 1980, abandoned.
This application Sep. 13, 1982, Ser. No. 417,459
Int. Cl.³ B61G 9/20
U.S. Cl. 213—62 R 2 Claims



1. A drawbar arrangment for connecting the adjacent ends of two adjacent railway vehicles each having

a drawbar pocket and stop means disposed within said drawbar pocket,

a buffing block disposed in each of said pockets and engageable with said stop means upon buff impact of said vehicles, said buffing blocks each having a planar buffing surface surrounded by a convex surface, and

an elongated drawbar having opposite ends extending into respective ones of said drawbar pockets,

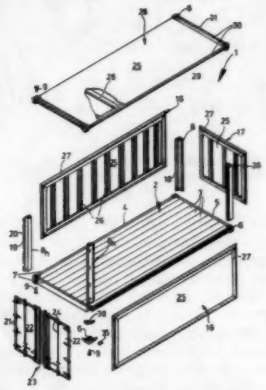
key means connecting said opposite ends of said drawbar in said drawbar pockets,

said drawbar ends each having a partially spherical surface and a concentric planar surface normal to the longitudinal axis of said drawbar, said spherical surface having a radius of curvature greater than one-half the length of said drawbar and the center of curvature thereof disposed on the longitudinal axis of said drawbar whereby when said railway vehicles are in buff condition and longitudinally axially aligned said drawbar planar surface and said buffing block planar surface are in substantially face to face engagement with said buffing block abutting said stop means so that said buffing forces are transmitted longitudinally through said drawbar and said railway cars, and when said railway cars are in buff condition and out of longitudinal axial alignment said drawbar spherical surface and said buffing block convex surface are in engagement with said buffing block abutting said stop means so as to impose said buff forces on said drawer ends on opposite sides of said longitudinal axis of said drawbar to cause said drawbar to become aligned with the longitudinal axes of said vehicles and simultaneously to exert opposing forces on said adjacent vehicles to cause the railway vehicles to become longitudinally aligned.

## 4,422,558
## CONTAINER FOR FREIGHT TRANSPORT

Gerhard Mittelmann, Oehningen; Klaus P. Brodbeck, Singen, and Gerd Bretschneider, Hilzingen, all of Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jun. 22, 1981, Ser. No. 275,802
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1980, 3024707
Int. Cl.³ B65D 8/10, 6/36
U.S. Cl. 220—1.5 10 Claims



1. A container for transporting goods, said container having a floor, a plurality of sidewalls, a roof and at least one door, the improvement which comprises: a plurality of posts extending between said floor and said roof, said plurality of posts each being provided with means for attaching said plurality of sidewalls to said plurality of posts; attachment means associated with said plurality of posts and said floor and said roof for releasably securing said plurality of posts to said floor and said roof wherein said floor and said roof are surrounded by a profiled frame, the corners of which are formed by said attachment means, said attachment means comprises a cube-shaped piece having on each of two vertical surfaces which are perpendicular to each other at least one tongue-like projecting flange and, on another surface perpendicular to said two vertical surfaces, step-like projections; and wherein said plurality of posts each comprises a hollow section adapted to mate with said step-like projections on said attachment means wherein the interior of each hollow section is subdivided by walls into a plurality of chambers, the cross section of each chamber corresponding to the cross section of a step-like projection on said attachment means so as to clamp said hollow section to said attachment means.

## 4,422,559
## MOLDED CONTAINER WITH SNAP-ON CLOSURE

H. Richard Landis, Oak Lawn, Ill., assignor to Landis Plastics Inc., Chicago Ridge, Ill.

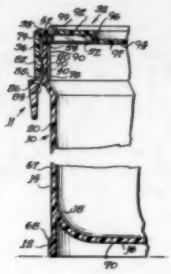
Filed Dec. 14, 1981, Ser. No. 330,710
Int. Cl.³ B65D 41/16, 41/18
U.S. Cl. 220—306 8 Claims

4. A molded plastic closure for a container having a circular opening and a circular interlocking bead means, said closure comprising a circular top wall, an outer annular skirt depending from said top wall, a circular bead on said outer annular skirt facing radially inwardly to interlock with said circular bead means on the container when the closure is pressed downwardly on the container; an inner annular skirt depending from said top wall concentric with said outer skirt providing a channel between said skirts for receiving the upper rim of the

container; stacking ring means on said upper circular wall of said closure;

an annular recess located in said top wall adjacent said inner skirt and extending radially inward;

a plurality of depending ribs integral with said closure and located in said recess with lower sides of the ribs extending closely adjacent a plane defined by the lower edge of said inner skirt so that the ribs will slide across the container rim to allow the rim to move into said channel and assist in snap fitting the closure onto a container with an interlocking of said closure bead and said container bead means with a downward force applied to the closure.



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**4,422,560**

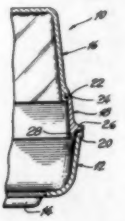
**FRYPAN LID**

**Harry Solomon, Ville St. Laurent, Canada, assignor to Toastess Inc., Pointe Claire, Canada**

**Filed Aug. 20, 1982, Ser. No. 409,825**

**Int. Cl.³ B65D *51/00***

**U.S. Cl. 220—377** **10 Claims**



1. A lid for a frying pan, comprising an upper transparent plastic cover and a lower heat resistant plastic collar fixedly connected to said transparent cover and adapted to fit on a rim of said frying pan, said collar acting as a heat insulating body between said cover and said frying pan whereby to prevent heat generated by said frying pan during use from adversely affecting said cover.

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**4,422,561**

**FUEL TANK COMPONENT**

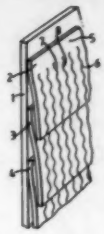
**Ronald L. Grosvenor, Wolverhampton, and Michael Fox, Wheaton Aston, both of England, assignors to IMI Marston Limited, Wolverhampton, England**

**Filed May 18, 1981, Ser. No. 264,692**

**Int. Cl.³ B65D *25/16***

**U.S. Cl. 220—461** **7 Claims**

1. In a fuel tank adapted to self-seal in the event of penetration, a tangling wall formed of a plurality of strips of material secured to the interior of the tank wall, some of the strips being cut so as to provide a plurality of strands having one end joined to a spine of the strip transverse to the strands and having free ends remote from the spine, the strands being in the form of flat elongate fronds having edges which include back and forth



bends presenting peaks and valleys, the spines being disposed in parallel rows with the strands of one spine overlapping the spine of the next adjacent row.

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**4,422,562**

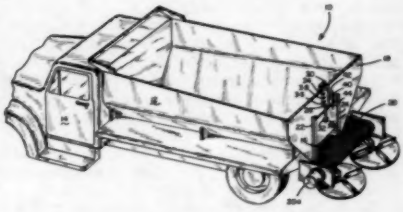
**GROUND CONTROL SYSTEM**

**James L. Rawson, Oelwein, Iowa, assignor to Rawson Control Systems, Inc., Oelwein, Iowa**

**Filed May 21, 1981, Ser. No. 266,083**

**Int. Cl.³ A01C *15/18***

**U.S. Cl. 222—55** **2 Claims**



1. Application rate control system for controlling opening of metering feedgate of a spreader with respect to vehicle travel speed and conveyor speed, said system comprising:

a. means for sensing travel speed of a vehicle, said means comprises a sensor connected to a gear train of said vehicle, means for ratioing said vehicle speed and connected to said travel speed sensing means, and means for incrementally selecting constants of swath width and application rate means for operationally amplifying a generated vehicle speed signal and connected to said ratio means;

b. means for sensing speed of a conveyor, said means comprises a sensor connected to a drive gear of said conveyor, means for ratioing width of said conveyor and connected to said conveyor speed sensing means, and means for incrementally selecting constant of density of material, means for operationally amplifying a generated conveyor speed signal and connected to said ratio means;

c. means for ratio selecting and connected to said constant selecting means;

d. means for differential amplifying output signals of said ratio selecting means and said constant selecting means;

e. means for sensing and controlling position of said metering feedgate comprising a double acting hydraulic servo control cylinder and a variable potentiometer for outputting a position control signal, said sensing and controlling means connected between said differential amplifier means and said ratio selecting means; and,

f. means for pulse modulating an output signal from said differential amplifier means to said double acting servo control hydraulic cylinder whereby said sensing and controlling

position means generates a closed loop feedback signal thereby providing for control of said metering feedgate with respect to said travel speed and said conveyor speed and said pulse modulation means controls positioning of said metering feedgate.

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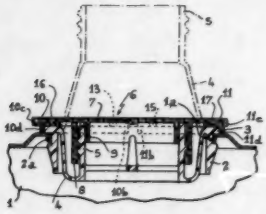
**4,422,563**

## NESTABLE POURING SPOUT ASSEMBLIES

**Pierre Babiol, Villefranche sur Saone, France, assignor to Societe Nouvelle de Bouchons Plastiques, Anse, France**

**Filed Jul. 13, 1981, Ser. No. 282,624**
**Claims priority, application France, Jul. 23, 1980, 80 16401**
**Int. Cl.³ B65D *25/44, 47/36***
**U.S. Cl. 222—153** **3 Claims**



1. A retractable pouring spout assembly for attaching to a container having an opening extending through one of its surfaces, the assembly comprising:

(a) a collar shaped to be inserted into said opening and be fixed to the container and having an upper periphery, the collar having a flexible tubular sleeve joined thereto and moveable between an upstanding extended position exposing an upper portion of the sleeve for pouring and a retracted position wherein said upper portion is nested within the collar and the container, said upper portion of the sleeve being threaded, and the upper periphery of the collar comprising annular flange means surrounding the collar and overlying the surface of the container;

(b) a closure cap having a threaded portion adapted to screw onto said upper threaded portion of the sleeve and having a head portion overlying and closing the sleeve, and the head portion having an outer periphery comprising annular half-rings overlying the annular flange means of the collar and having downwardly extending annular rib means surrounding said annular flange means and abutting the surface of the container, the half-rings being integrally connected to the head portion of the cap by multiple frangible bridges, whereby the half-rings can be disengaged from the upper periphery of the collar when the bridges are ruptured; and

(c) means for preventing unscrewing of the closure cap when the sleeve is nested in the container comprising, mutually interfering protrusions and notches opposedly carried by said annular means of the collar and of the closure cap.

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**4,422,564**

## NEEDLE THREADING DEVICE

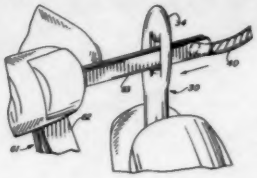
**Herbert G. Koenig, and Margaret E. Koenig, both of 807 Grossman Ave., Rhinelander, Wis. 54501**

**Filed Oct. 20, 1980, Ser. No. 198,305**
**Int. Cl.³ D05B *87/00***
**U.S. Cl. 223—99** **3 Claims**

1. A needle threading apparatus for inserting a thread in the eye of a needle, said apparatus comprising:

(a) a pair of substantially planar blades of substantially rigid material each having a distal end and a proximal end and being joined at their opposite proximal ends; and

(b) said blades defining a space therebetween for reception of a section of thread and being substantially equal in length and being in a normally open position, said blades having a width and thickness so that at least the distal ends of the said blades are adapted to be inserted through the



eye of a needle whereby thread can be inserted between the blades and the blades pinched together and the yarn drawn through the eye of the needle.

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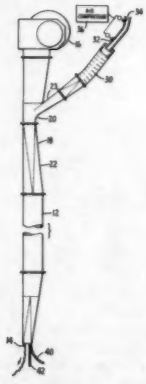
**4,422,565**

## STRIP MATERIAL TRANSPORTING APPARATUS

**Imants Reba, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.**

**Filed Dec. 7, 1981, Ser. No. 328,355**
**Int. Cl.³ B65H *17/32***
**U.S. Cl. 226—97** **9 Claims**



1. Apparatus for transporting strip materials from a first location to a second location comprising, in combination:

a first conduit defining an interior leading to said second location;

a venturi device including a venturi throat and venturi diffuser disposed along said first conduit and in communication with the interior thereof;

means for generating fluid flow in said first conduit interior and through said venturi throat and diffuser;

a second conduit leading from said first location to the vicinity of said venturi throat; and

auxiliary fluid flow generating means for entraining said strip material at said first location and transporting said strip material through said second conduit to said venturi throat.

4,422,566

## ARRANGEMENT FOR GUIDING PRINT WEBS ON CYLINDERS OF ROTARY PRINTING MACHINES

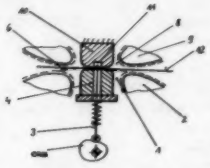
Klaus Goerner; Manfred Dietze, and Rainer Birkner, all of Leipzig, German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz", Leipzig, German Democratic Rep.

Filed May 13, 1981, Ser. No. 263,466

Claims priority, application German Democratic Rep., May 13, 1980, 221059

Int. Cl.³ B65H 17/20

U.S. Cl. 226—191 15 Claims



14. An arrangement for guiding and holding a print web moving between cylinders of a rotary printing machine, the cylinders having outer surfaces rolling over one another, the arrangement comprising passage means including at least one passage provided in at least one of the cylinders and being open at the outer surface of the latter; means for preventing slippage of the web between the cylinders and including at least one element which is located in said one passage and extends at least to the outer surface of the one cylinder so as to cooperate with the print web, said element of said slippage preventing means being formed as a needle controllable in a rhythmic manner and arranged to start functioning at a predetermined starting point; and means for controlling said needle in a rhythmic manner, said controlling means being arranged to control said starting point in a rhythmic manner.

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4,422,567

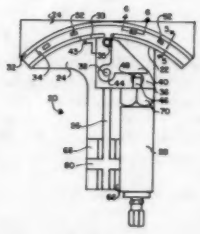
## MEDICAL SUTURING DEVICE

Taylor H. Haynes, Medical Plaza Central #1, Salt Lake City, Utah 84112

Filed Nov. 17, 1981, Ser. No. 322,351

Int. Cl.³ A61B 17/04

U.S. Cl. 227—19 13 Claims



1. A medical suturing device comprising:

a base,

a head removably attached to said base, said base having a portion opposite said head,

said head including a body member, a rocker plate, a rocker arm rotatably attached to said rocker plate and a wedge,

said rocker plate being attached to said body member, said body member including a first means for receiving staples and a second means for receiving said wedge such that said wedge is slidably located in said second means,

said wedge having a portion which abuts the rocker arm,

said head also including a third means for attaching to a power mechanism,

said third means including a member which abuts said rocker arm and has an in and an extended position, and,

a staple driver which extends between said wedge and said staples,

wherein when said power mechanism is activated, said member moves from the in to the extended position, rotating said rocker arm which in turn slides said wedge within said first means and drives said staples through a workpiece.

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4,422,568

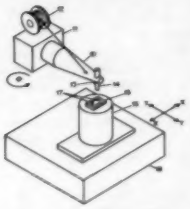
## METHOD OF MAKING CONSTANT BONDING WIRE TAIL LENGTHS

Richard J. Elles, Philadelphia; Razon Ely, Hatboro, and Dan Vilenski, Horsham, all of Pa., assignors to Kulicke and Soffa Industries, Inc., Horsham, Pa.

Filed Jan. 12, 1981, Ser. No. 224,099

Int. Cl.³ B23K 1/06

U.S. Cl. 228—111 8 Claims



1. The method of forming an exact predetermined shape and length of fine wire under the face of a bonding wedge after making a second wire bond with an automatic wedge bonding machine of the type having a bonding wedge and a non-articulating wire clamp comprising the steps of:

making a second wire bond at a second bonding point on a semiconductor device to connect the second of two bonding points with a length of fine wire,

providing an open wire clamp adjacent the rear of said bonding wedge,

raising said bonding wedge relative to said second bonding point substantially vertically a small predetermined distance to pay out wire below said bonding wedge without permanently deforming the wire,

moving said bonding wedge laterally relative to said second bonding point to pay out an exact predetermined straight axial length of fine wire under the center of the working face of said bonding wedge without permanently deforming the wire,

ceasing movement of said bonding wedge relative to said second bonding point long enough to stop movement of said bonding wedge and damp out harmful vibrations,

closing said wire clamp on said fine wire to fix the length of fine wire extended under the face of said bonding wedge,

moving said bonding wedge relative to said second bonding point in a predetermined inclined angle direction aligned with the axial direction of said fine wire which maintains said fixed length of straight fine wire under the face of said bonding wedge while simultaneously moving said bonding wedge substantially vertically relative to said second bonding point, thereby

breaking said straight fine wire at a point adjacent said second wire bond, and

leaving a predetermined length of said straight fine wire inclined under the working face of said bonding wedge which is formed at a predetermined angle between the working face of said bonding wedge.

4,422,569

## FORMING METAL ARTICLES

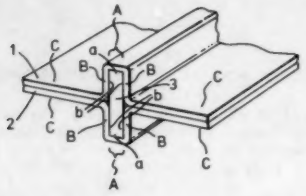
Dennis J. Payne; Martin H. Mansbridge; John Norton, and Sidney J. Swadling, all of Filton, England, assignors to British Aerospace Public Limited Company, London, England

Filed Feb. 13, 1981, Ser. No. 234,265

Claims priority, application United Kingdom, Feb. 15, 1980, 8005255

Int. Cl.³ B23K 31/00

U.S. Cl. 228—173 C 7 Claims



1. A method of forming a stiffened metal panel including a web region and a flange region to stiffen the panel, which method includes the step of:

(a) placing two sheet members of a superplastically deformable material in opposed, spaced-apart relationship to either side of a reinforcing structure;

(b) heating the two sheet members to a temperature range within which superplastic deformation can take place;

(c) urging respective first regions of the two sheet members against respective opposed regions of the reinforced structure;

(d) superplastically deforming, by gaseous pressure, the remaining portions of the sheet members so that they bulge towards each other;

(e) continuing said superplastic deformation of the sheet members until respective second regions of each, adjacent the respective first regions, are urged against the reinforcing structure and respective third regions of which adjacent the respective second regions are urged, solely by gaseous pressure to meet each other in a common substantially planar region lying intermediate said opposed regions of the reinforcing structure; and

(f) bonding the third regions of one sheet member to those of the other to form said web region, and the reinforcing structure, together with respective first and second regions of the sheet members defining said flange region.

4,422,570

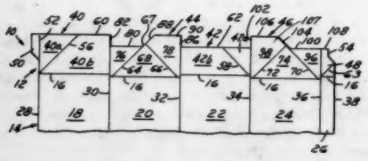
## FLAT TOP END CLOSURE FOR LIQUID CONTAINERS

Robert E. Lisiecki, Orchard Lake, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Aug. 26, 1982, Ser. No. 411,739

Int. Cl.³ B65D 5/74

U.S. Cl. 229—17 R 6 Claims



1. A flat top end closure for a liquid carrying, paperboard container having a tubular body, said flat top end closure comprising two oppositely disposed fold-in panels, one of which serves as a pouring spout, and two oppositely disposed outer closure panels, said fold-in panels each including a substantially triangular panel portion defined by converging diagonal score lines and being integrally connected to said tubular body, and a pair of fold-back panels integrally connected to and folded between said substantially triangular panel portion and the respective adjacent outer closure panels, said two oppositely disposed outer closure panels including one shorter and one longer panel, with the edge portion of said longer panel overlapping said shorter panel, a lift tab formed on a side edge of said longer panel for lifting the portion of said longer panel which overlies said pouring spout and the one fold-back panel adjacent thereto, and a lift tab formed on the other of said fold-back panels for first lifting said other fold-back panel and the portion of said shorter closure panel which overlies said other fold-back panel and then opening the full infolded panel into a pouring spout.

4,422,571

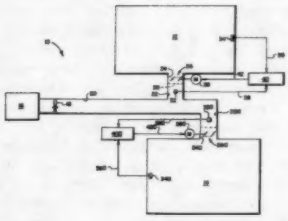
## PROPORTIONAL MOTOR DRIVE CONTROL

William W. Bowman, Dallas, Tex., assignor to Hoffman Controls Corp., Dallas, Tex.

Filed May 22, 1981, Ser. No. 266,461

Int. Cl.³ F24F 7/00; F25D 17/04

U.S. Cl. 236—49 7 Claims



1. In a method for providing a drive control signal to a damper motor for opening and closing a damper in a system for supplying conditioned air to a room through a duct, the improvement comprising:

comparing an electrical signal proportional to the temperature in the said room with an electrical signal proportional to the velocity of air flow through said duct, and

driving said damper motor to operate said damper in a direction determined by the greater of said temperature signal or the said velocity signal.

4,422,572

## ENGINE COOLING WATER CIRCULATION SYSTEM

Yukio Sakurai, Atsugi; Masao Okajima, Yamato, and Arifumi Inoue, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 4, 1981, Ser. No. 327,489

Claims priority, application Japan, Dec. 22, 1980, 55-184600[U]

Int. Cl.³ B60H 1/02

U.S. Cl. 237—12.3 B 9 Claims

1. An engine cooling water circulation system for an engine having a water jacket therein, comprising:

a radiator having a water inlet thereon;

a first hose for feeding cooled water from the radiator to the engine water jacket;

a second hose for feeding heated water from the engine water jacket to said radiator;

a heater core of a passenger room heater;

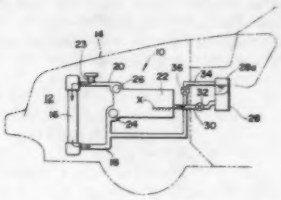
a third hose leading from the engine water jacket to a lower portion of said heater core for feeding the heated water from said engine water jacket to said heater core;

a fourth hose leading from an upper portion of said heater core to said first hose for feeding the cooled water from

said heater core to said first hose, said lower portion being positioned at a lower level than said upper portion; and

valve means disposed in said fourth hose at a portion near said upper portion of said heater core, said valve means being capable of providing a communication between said interior of said heater core and the open air under a certain condition,

said valve means comprising a two-way valve which has



first and second conditions, said first condition being a condition wherein the communication between the heater core and said first hose is established while blocking the communication between the interior of said heater core and the open air, and said second condition being a condition wherein the communication between the interior of said heater core and the open air is established while blocking the communication between the heater core and said first hose.

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**4,422,573**

**HEATING SYSTEM**

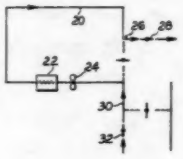
**Frederick R. Morgan, Marlow, England, assignor to Radiant Tube Systems Limited, London, England**

**Filed Dec. 18, 1981, Ser. No. 332,014**

**Claims priority, application United Kingdom, Nov. 5, 1981, 8133360**

**Int. Cl.³ F24H *3/00***

**U.S. Cl. 237—70** **4 Claims**



1. A space heating system comprising an endless loop of duct suspended high in the said space, said duct having an exposed lower surface arranged to radiate heat when said duct is heated, having an upper surface insulated against heat loss and having lateral surfaces provided with convection spoilers to minimize heat transfer by currents of ambient air flowing past said surfaces, a fan in said loop for moving gases in and along said loop, and an auxiliary heater which is arranged to heat gases flowing in said loop and is located adjacent to the downstream side of the fan, wherein the improvement comprises

(a) a branch duct having its one end connected to a source of process gas combustion products and its other end connected to said loop adjacent to the upstream side of the fan,

(b) a dampered fresh air inlet connected to said branch duct for diluting the process gas to limit its temperature,

(c) a damper in said branch duct, between said air inlet and the source of process gas, which can be closed to permit said loop to be purged with air,

(d) a dampered outlet connected to said loop at a point remote from the downstream side of the fan, and

(e) a damper in said loop between said outlet and said branch duct to control recirculation.

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**4,422,574**

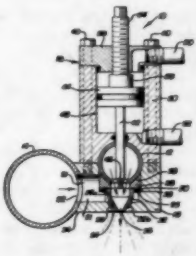
**SPRAY ENROBER NOZZLE CONSTRUCTION WITH REMOVABLE AND INTERCHANGEABLE COMPONENTS**

**James Mancuso, Jr., Huntington Beach, Calif., assignor to Par-Way Manufacturing Co., Costa Mesa, Calif.**

**Filed Jan. 25, 1982, Ser. No. 342,118**

**Int. Cl.³ B05B *15/02***

**U.S. Cl. 239—118** **1 Claim**



1. In an enrober for applying an ingredient spray to food products, an ingredient spray apparatus comprising:

a spray air tube for carrying spray air to assist in the spray of a food ingredient;

a first housing section defining a round outer orifice, a shoulder at least partially surrounding said outer orifice and an air conduit connecting said spray air tube to said outer orifice;

a plurality of separately formed interchangeable nozzle pieces each having a ring-shaped portion adapted to be seated on said shoulder and an inner orifice defining portion that is at least partially conical depending from said ring-shaped portion and adapted to be disposed within said outer orifice;

a second housing section removably secured to said first housing section;

an ingredient tube for carrying said food ingredient, said ingredient tube extending between said first and second housing sections and defining an ingredient opening that communicates through an installed one of each nozzle pieces with said inner orifice thereof;

a connection piece disposed between said nozzle piece and said ingredient tube;

a sealing member disposed between said installed nozzle piece and said connection piece;

a plurality of interchangeable cleanout plungers, each corresponding to one of said nozzle pieces and adapted to extend through said ingredient tube in alignment with said inner orifice;

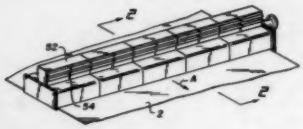
pneumatic means disposed within said second housing section for causing periodic reciprocation of said plunger; and

means for adjusting the home position of said plunger with reference to said inner orifice.

## 4,422,575
## STEAM DISTRIBUTOR WITH PLUG VALVE

Norman F. Dove, 1493 Crown St., North Vancouver, British Columbia, Canada V7J 1G4

Filed Aug. 17, 1981, Ser. No. 293,113
Int. Cl.³ A62C 37/20
U.S. Cl. 239—562 10 Claims



1. A steam distributor to apply steam to a paper sheet moving beneath it, the distributor comprising:
- a steam supply header;
- a chamber to receive steam from the header;
- outlets in the chamber whereby steam is passed to the paper sheet;
- first pipes communicating the header with the chamber;
- an outlet for each first pipe in the chamber;
- an inlet for each first pipe to allow steam into the pipe from the header;
- a valve member extending to an open end of each first pipe and co-operating with the open end to control the flow of steam through the open end;
- means to reciprocate the valve member towards and away from the open end of the pipe;
- first locating means locating the valve member in the distributor; and
- second locating means locating each first pipe relative to the first locating means to maintain the pipe in constant alignment with the valve member.

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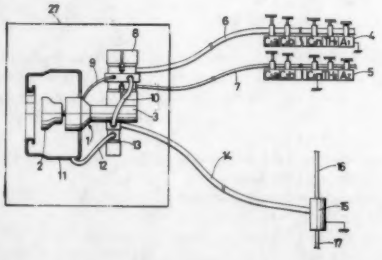
## 4,422,576
## ELECTROSTATIC COATING MACHINE AND METHOD OF CHANGING COLOR OF PAINTS THEREBY

Eiji Saito, Kamakura; Shoji Aizawa; Michio Mitsui, both of Yokohama; Tomohiko Miyata, Tokyo, and Masayuki Kuroda, Kawasaki, all of Japan, assignors to Ransburg Japan, Ltd., Tokyo, Japan

Filed Jul. 28, 1981, Ser. No. 287,818
Claims priority, application Japan, Aug. 4, 1980, 55-106955
Int. Cl.³ B05B 5/04
U.S. Cl. 239—693 2 Claims



1. An electrostatic coating machine comprises:
- a coating machine main body having a rotary atomizing head which is applied with a high voltage and a cleaning shroud reciprocatingly provided to move between a position surrounding said rotary atomizing head and retracted therefrom;
- first and second color change valve mechanisms respectively being adapted to feed a plurality of paints and cleaning fluids to said rotary atomizing head;
- first and second paint feed pipes, each having one end connected with said first and second color change valve mechanisms respectively;
- a first change-over valve being connected with the other ends of said first and said second paint feed pipes and provided at a position close to said rotary atomizing head;
- a third paint feed pipe connected between said first change-over valve and said rotary atomizing head to allow supplying paint and cleaning fluid selectively from either of said first paint feed pipe and said second paint feed pipe with said rotary atomizing head by way of said first change-over valve;
- a first drain pipe being connected to said first change over valve in such a manner as to drain paint and cleaning fluid selectively from one of said first paint feed pipe and said second paint feed pipe;
- a second drain pipe connected to said cleaning shroud for draining cleaning fluid flowing out of said cleaning shroud;
- a third drain pipe communicating with said first drain pipe;
- a second change-over valve provided between said second drain pipe and said third drain pipe, and adapted to selectively bring said second drain pipe into communication with said third drain pipe;
- a discharge suction communicating with said third drain pipe for forcibly discharging fluid from said third drain pipe; and
- wherein said cleaning shroud, said first change-over valve and second change-over valve are disposed in a high voltage section at the same potential as said rotary atomizing head when a high voltage is applied to said rotary atomizing head, and wherein each of said first and second color change valve mechanisms and said discharge section are disposed on the side of the ground.

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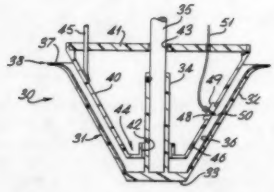
## 4,422,577
## ELECTROSTATIC SPRAYING

Arthur J. Arnold, Harpenden, and Barry J. Rye, Luton, both of England, assignors to National Research Development Corporation, London, England

Filed Jul. 30, 1981, Ser. No. 288,372
Claims priority, application United Kingdom, Aug. 6, 1980, 8025570
Int. Cl.³ B05B 5/04
U.S. Cl. 239—703 13 Claims



1. Apparatus for the electrostatic spraying of liquid comprising a high capcity nozzle having: inlet means for admitting a supply of liquid; a rotatable member having an internal liquid distribution surface disposed in use about a substantially vertical axis to receive the liquid at a first level such that on rotation the liquid is centrifugally atomised from a circumferential edge of the member at a second level higher than the first level, at least a part of the distribution surface between the first and second levels being conductive and the conductive surface being substantially electrically isolated from metallic electrical connection; and electrode means so spaced within the rotatable member that conduction occurs in an air path between the electrode means and the conductive surface such that the

conductive surface is maintained substantially at the electrode potential, the conductive surface being of such extent relative to the position of the electrode means that the electrode means is substantially shielded from any direct leakage path to an external surface at earth potential and the flow of liquid over the conductive surface being effective to charge the liquid before atomisation.

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**4,422,578**

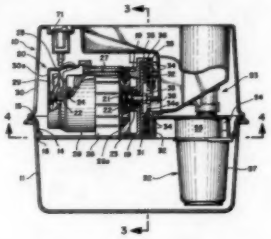
## ROTARY GRAIN MILL HAVING MEANS FOR CONTROLLING AIR AND GRAIN FLOW THERETHROUGH, AND METHOD

**Leon R. Scott, Sandy, Utah, assignor to Stratford Squire International, Salt Lake City, Utah**

**Filed Sep. 4, 1981, Ser. No. 299,499**

**Int. Cl.³ B02C *7/11***

**U.S. Cl. 241—6** **8 Claims**



1. A rotary mill for milling particulate grain material, comprising a housing; a first disc having radially spaced concentric rows of teeth extending therefrom, said disc being mounted for rotation in said housing; a second disc having radially spaced concentric rows of teeth extending therefrom and mounted in the housing in spaced, confronting axial alignment with the first disc so that the rows of teeth on the first and second disc overlap forming alternating rows of radially spaced, interposed teeth; means for rotating the first disc relative to the second; inlet means for supplying grain and air to the area between the discs inwardly of the innermost row of teeth; outlet means for air and material that has passed radially through the interposed rows of teeth; means in substantially air-tight communication with the outlet means for collecting the milled grain material from the outlet; and air valve means in communication with the collecting means for controlling the amount of air flow from and through the collecting means, which, in turn, controls the air flow through the mill.

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**4,422,579**

## FEEDING DEVICE FOR A JET MILL

**Jouko Niemi, 33960 Pirkkala 6, Pirkkala, Finland**

**Filed Nov. 23, 1981, Ser. No. 324,085**

**Claims priority, application Finland, Nov. 25, 1980, 803663**

**Int. Cl.³ B02C *19/06***

**U.S. Cl. 241—39** **9 Claims**

1. A combined jet mill and device for feeding particulate material thereto and simultaneously disintegrating any clogged material, comprising:

a jet mill having an inlet for receiving particulate material;

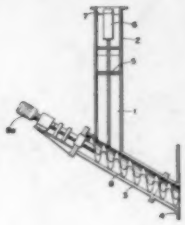
a substantially vertical plug pipe having an upper inlet opening and a lower outlet opening;

a feed funnel for receiving particulate material connected to said inlet opening of said plug pipe;

at least one plunger means arranged for operation in said feed funnel and cooperable with at least one wall of said funnel to force particulate material from said funnel into said plug pipe to form a plug of material in said plug pipe;

said at least one plunger means comprising a cylinder connected to said feed funnel and a plunger piston movably mounted to said cylinder and in said feed funnel toward said inlet opening of said plug pipe;

an additional pipe connected to said outlet opening of said plug pipe and having an end connected to said inlet of said jet mill, for receiving compressed particulate material in the form of the plug from said pipe; and



a screw feeder rotatably mounted in said additional pipe for conveying and disintegrating the material from said plug pipe to said jet mill;

whereby the plug of particulate material formed in said plug pipe by said at least one plunger means forms a gas-tight plug against admission of gas from said jet mill into said funnel.

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**4,422,580**

## MACERATOR PUMPING IMPELLER

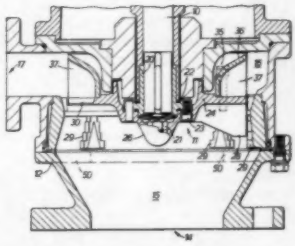
**Nigel R. C. Shepherd, Ross-on-Wye, and Graham M. Preece, Checkley, both of England, assignors to The Haigh Engineering Co. Ltd., United Kingdom**

**Filed Jun. 9, 1981, Ser. No. 272,023**

**Claims priority, application United Kingdom, Jun. 11, 1980, 8019074**

**Int. Cl.³ B02C *23/36***

**U.S. Cl. 241—46.11** **5 Claims**



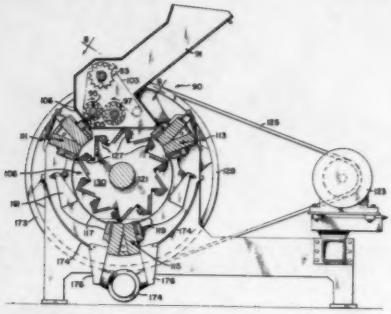
1. A macerator including a casing, a shaft mounted in said casing, an impeller mounted on the shaft and having at least one slot passing axially therethrough, said impeller having has on its upstream side upstanding fins and on its downstream side an outwardly flared annular member on which is mounted a number of external radial vanes, said casing and said impeller defining a discharge chamber about said outwardly flared annular member, said discharge chamber being sized with respect to said annular member such that rotation of said annular member therein creates a pumping effect on effluent in said discharge chamber and on effluent upstream of said impeller adequate to draw further effluent through said at least one slot.

**4,422,581**

## APPARATUS FOR RECOVERING RUBBER FROM RUBBER TIRES

**Milton R. Chryst, 7025-125th Ave. SE., Snohomish, Wash. 98290**

**Filed Jan. 15, 1981, Ser. No. 225,434**
**Int. Cl.³ B02C** *18/06*
**U.S. Cl. 241—66** **43 Claims**



1. An apparatus for granulating rubber, comprising:

means for feeding rubber-containing material, such as tires, into the apparatus;

cutting chamber means which includes at least three stationary cutting blade stations located around the inner circumference of the cutting chamber means, wherein a first stationary cutting blade station is located substantially at the bottom center of the cutting chamber means, and wherein the second and third stationary cutting blade stations are located in the upper half portion of the circumference of the cutting chamber means, on opposite sides thereof, each of said stationary cutting blade stations including at least one stationary cutting blade, the cutting chamber means further including at least one set of rotary cutting blades, mounted so as to rotate within the cutting chamber means, the rotary cutting blades passing the stationary cutting blades in a cutting relationship thereto, wherein the relative spacing of the stationary cutting blade stations and the rotary cutting blades in the one set thereof is such that only one rotary cutting blade is contacting a stationary cutting blade in a cutting relationship at any one time, so as to significantly reduce the vibration of the apparatus in operation, which in turn increases the durability of and extends the life of the apparatus, said cutting chamber means further including screen means which extend between said first cutting blade station and the second and third cutting blade stations, respectively, said screen means permitting granules of desired size to fall therethrough; and

means for rotating the rotary cutting blades within the cutting chamber means.

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**4,422,582**

## FOOD PROCESSING MACHINE

**Carl R. Roeger, Troy; William D. Miller, Bradford, and Charles R. Goodin, Troy, all of Ohio, assignors to Hobart Corporation, Troy, Ohio**

**Filed Oct. 22, 1981, Ser. No. 313,532**
**Int. Cl.³ B02C** *18/36*
**U.S. Cl. 241—82.5** **2 Claims**

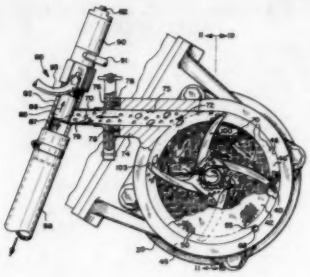
1. In a meat grinder having bone chip removal and including a cylinder, a grinding plate at a discharge end of said cylinder, a screw rotatably mounted therein for conveying a meat product to said grinding plate, and a knife mounted on the end of said screw at the grinding plate for cutting the meat product, the improvement comprising the combination of:

means in said cylinder immediately axially inwardly of said grinding plate defining a bone chip discharge outlet,

said grinding plate having a pattern of extrusion holes therethrough, which pattern terminates radially inwardly of the plate periphery to form an outer solid annular perimeter,

a knife having an integral central hub and blades with tips thereof extending radially beyond said hole pattern and sweeping in close proximity to the inside surface of said cylinder, said blades being of substantially uniform depth in an axial direction throughout their lengths,

each blade having a forward surface generally normal to a radial plane therethrough, said forward surface being



formed with a curvature in the radial direction which recedes from the hub opposite to the direction of rotation of the knife so that bone chip fragments encountering said forward surfaces are provided with an outward force component tending to move said chips toward the tips of said blades, said blades effectively sealing off arcuate segments of space between adjacent blades and thereby providing a series of spaces for entrapment of said bone chips for purging through said discharge outlet,

a conduit leading from said discharge outlet, and

valve means in said conduit for opening said conduit to discharge into a region of low pressure whereby accumulated meat product rich with bone chips or the like is removed from said perimeter region.

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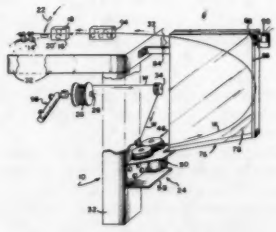
**4,422,583**

## WIRE FEEDER

**Richard B. Maxner, and Vitaly Bandura, both of Danvers, Mass., assignors to USM Corporation, Farmington, Conn.**

**Filed Dec. 14, 1981, Ser. No. 330,265**
**Int. Cl.³ B65H** *59/00, 59/04, 51/20, 59/38*
**U.S. Cl. 242—45** **3 Claims**



1. A wire feeder for removing wire from a reel of wire and feeding the wire to a wire length cutting station at a constant feed pressure so that a consistent length of wire can be cut from the reel including;

a. feed means for removing the wire from the reel and a

spring biased idler pulley positioned between the reel and the feed means to maintain the wire between the reel and feed means under constant tension;

b. said feed means comprising a pair of rollers for frictionally engaging the wire and drawing the wire from the reel, a motor for driving at least one of said rollers, said rollers having inter-engaging gear teeth so that rotation of one roller by the motor causes an opposite rotation of the other roller so that the rollers can draw the wire off the reel;

c. a guide housing adjacent said feed means to receive the wire from the said feed means to contain the wire in a predetermined configuration;

d. said guide housing comprising opposed spaced side wall members which receive the wire and an end wall against which the wire comes in contact;

e. said end wall being pivotally mounted to said side wall members and having means controlling a limit switch which controls the operation of the roller motor so that as wire is fed into the guide housing and contacts the end wall, the limit switch will be energized to shut off the roller motor so that additional wire will not be fed into the guide housing;

f. means to draw the wire out of the guide housing and cut the wire to a desired length at the length cutting station so that as wire is removed from the guide housing, the wire will no longer contact the end wall so that the limit switch can again be operated to energize the roller motor causing the rollers to withdraw more wire from the reel into the guide housing so a consistent length of wire is present in the guide housing under a constant feed pressure which is isolated from the reel.

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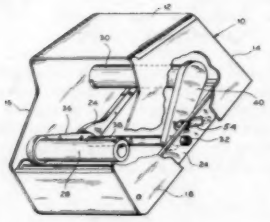
**4,422,584**

## TOILET PAPER DISPENSER WITH SWINGING MANDRELS

**Merwin J. Dashnier; James A. Diring, and Donald G. Krueger, all of Green Bay, Wis., assignors to Wisconsin Tissue Mills, Inc., Menasha, Wis.**

**Filed Oct. 9, 1981, Ser. No. 309,946**
**Int. Cl.³ B65H *19/04***
**U.S. Cl. 242—55.3** **4 Claims**



**1.** In a toilet paper dispenser having wall means defining a housing and a dispensing opening, the improvement comprising:

(1) first and second mandrels;

(2) support means for supporting the mandrels from a common pivot; and

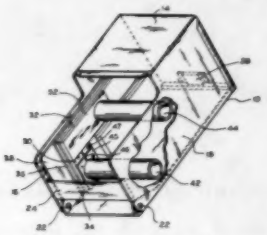
(3) engagement means on the support means to cause movement of the second mandrel from a storage position to a free swinging position so that the second mandrel can swing about the pivot by gravity to a lower dispensing position upon movement of the first mandrel from a dispensing position to an exhausted core storage position, the engagement means not being engaged when the second mandrel is in its free swinging position.

**4,422,585**

## TOILET PAPER DISPENSER WITH SLIDING MANDRELS

**Arthur N. Schultz; James A. Diring, and Donald G. Krueger, all of Green Bay, Wis., assignors to Alwin Manufacturing Company, Inc., Green Bay, Wis.**

**Filed Sep. 21, 1981, Ser. No. 304,721**
**Int. Cl.³ B65H *19/08, 49/00***
**U.S. Cl. 242—55.53** **3 Claims**



**1.** In a paper roll dispenser, including wall means defining an enclosure having an access opening for access to rolls of paper stored therein for dispensing therefrom, the improvement comprising first and second roll supporting mandrels, guide means on said wall means, said guide means including first and second intersecting track portions, slide block means integrally connected to said mandrels for supporting said mandrels in said guide means to afford first and second positions for each of said mandrels within said track portions with said slide block means for said first and second mandrels engaging and supporting said second mandrel in a first position in said track portions above said first mandrel a first position at said intersection of said first and second track portions and blocking downward movement of said second mandrel to said second position for dispensing when said mandrels are in said first position, and said first mandrel is in said first position for dispensing.

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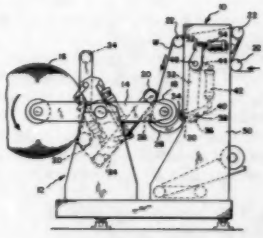
**4,422,586**

## METHOD AND APPARATUS FOR ROLL CHANGING

**Richard S. Tetro, Fulton, N.Y., assignor to The Black Clawson Company, Middletown, Ohio**

**Filed Nov. 27, 1981, Ser. No. 325,445**
**Int. Cl.³ B65H *19/26, 19/28***
**U.S. Cl. 242—56 R** **12 Claims**



**1.** A method of severing a web being wound on a winding machine, including the steps of:

applying an adhesive strip on the outer surface and extending along the length of a new core upon which web is to be wound;

positioning the new core adjacent but out of engagement with a free running span of the web and rotating said core;

positioning a cutting blade in stationary location adjacent

said core and adjacent to but out of engagement with said web downstream of said core; and

urging said web into engagement with said rotating core so that said adhesive strip will engage the surface of said web across its width and adhere thereto and cause said web to engage said blade so as to be severed thereby adjacent said adhesive strip while a leading edge of severed web remains adhered to said adhesive strip to cause said web to be wound on said core.

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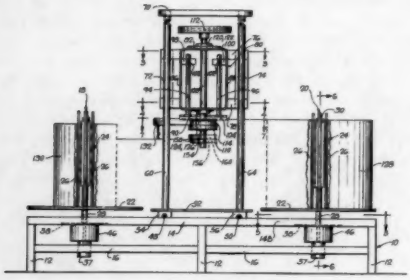
**4,422,587**

## MACHINE FOR SLITTING STRIPS OF SHEET MATERIAL

**Theodore Primich, Merrillville, Ind., assignor to Gary Steel Products Corp., Gary, Ind.**

**Filed Dec. 19, 1980, Ser. No. 218,220**
**Int. Cl.³ B65H *35/02***
**U.S. Cl. 242—56.2** **14 Claims**



1. A device for slitting a narrow strip from a wider coil of elongated strip of sheet material comprising, in combination:

a frame,

a first mandrel and a second mandrel, said mandrels being adapted to receive the coil of sheet material,

means for mounting the first mandrel and second mandrel at spaced locations along an axis on the frame, said first mandrel and second mandrel being rotatable with respect to the frame about parallel spaced axes,

a carriage, means for mounting the carriages on the frame between the first mandrel and second mandrel for translation along an axis of elongation normal to the axis between the first mandrel and the second mandrel,

a pair of shafts, means for mounting the shafts on the carriage for rotation about spaced parallel axes, said shafts being generally parallel to the axes of the first and second mandrel,

a first circular knife mounted on one shaft of said pair for rotation about the center thereof in a plane normal to the one shaft and a second circular knife mounted on the other for rotation about the center thereof in a plane normal to said other shaft of said pairs, the perimeter of said knives being adjacent to each other to form a cutting interface,

means for positioning said knives at a controlled position between the frame and the edge of the elongated strip opposite the frame,

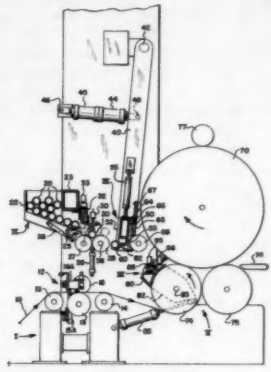
and means for translating the elongated strip from one mandrel to the other mandrel.

**4,422,588**

## SLITTER-REWINDER SYSTEM

**Heinz K. Nowisch, Fulton, N.Y., assignor to The Black Clawson Company, Middletown, Ohio**

**Filed Sep. 28, 1981, Ser. No. 305,821**
**Int. Cl.³ B65H *19/00, 35/02, 37/02;* B32B *31/18***
**U.S. Cl. 242—56.3** **12 Claims**



1. A slitter-rewinder system comprising:

a slitter having knives movable into a plurality of preselected transverse positions,

a core cutter section comprising means for supporting a core, core cutting means positioned adjacent said core support means and movable transversely into a plurality of preselected positions corresponding to the positions of said slitter knives and operable to cut a core thereon into a plurality of core sections corresponding in length and position to the corresponding transverse spacing and placement of said slitter knives,

a pair of winder drums for receiving a slit web from said slitter for winding on a core,

transporter means for carrying said core sections from said core support for placement in said winder drums,

a combined web cutting and adhesive applying section, including a transverse support positioned adjacent said winder drums, a carriage mounted for movement transversely of said support, said carriage having cutter means for severing said web between said winder drums and a wound roll, said carriage further having adhesive applicator means thereon for applying an adhesive to the trailing end of the web from the roll so that the same may be secured to the roll and for applying adhesive to the lead end of the web for application to a core in winding position on said winder drums.

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**4,422,589**

## FRICTION TRANSMITTING APPARATUS

**Hitoshi Okada, Toda, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan**

**Filed Sep. 28, 1981, Ser. No. 306,566**
**Claims priority, application Japan, Sep. 30, 1980, 55-138831**
**Int. Cl.³ B65H *17/02;* H02K *49/10***
**U.S. Cl. 242—68.1** **1 Claim**

1. A force transmitting apparatus for use in a magnetic recording/reproducing apparatus, which comprises: a rotatable reel shaft provided in the magnetic recording/reproducing apparatus, said reel shaft having a reel-driving hub mounted on one end thereof; an annular driving pulley coaxially mounted on said reel shaft for rotation with respect thereto, said driving pulley having a coaxial, annular, flat, axial end face facing toward said one end of said reel shaft; a coaxial, annular, magnetically attractable, flat disc affixed to said axial end face of

said driving pulley for rotation therewith; a coaxial, annular, flat magnet affixed to said reel shaft and located between said reel-driving hub and said pulley, said magnet being disposed in coaxial, opposed relationship to said disc so that said disc is attracted to said magnet whereby said driving pulley is magnetically held in driving engagement with said magnet and thereby with said reel shaft; and a detector for detecting rotation of said magnet, said detector being disposed between said reel-driving hub and said pulley at a location radially outwardly from the periphery of said magnet.

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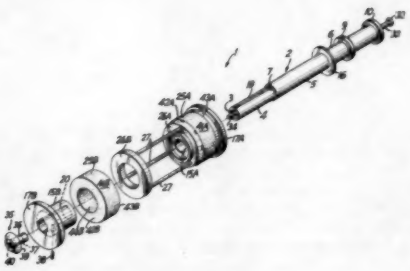
4,422,590

## STUB SHAFT

James W. Rathbone, Waynesville, N.C., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 17, 1981, Ser. No. 302,980
Int. Cl.³ B23B 5/22, 31/40; B65H 75/18
U.S. Cl. 242—68.3 3 Claims



1. A stub shaft assembly comprising:
(a) a hollow shaft having a through bore;
(b) a fixed chuck removably mounted on said shaft, said fixed chuck having an outer circumferential portion having a smooth surface and a radially outwardly extending flange disposed adjacent to said outer circumferential portion of said fixed chuck;
(c) a first elastomeric gripping ring mounted on said outer circumferential portion of said fixed chuck;
(d) a first pressure plate mounted on said outer circumferential portion of said fixed chuck whereby said first elastomeric gripping ring is sandwiched between said first pressure plate and said flange on said fixed chuck;
(e) a sliding chuck removably slidably mounted on said hollow shaft, said sliding chuck having an outer circumferential portion having a smooth surface and a radially outwardly extending flange disposed adjacent to said outer circumferential portion of said sliding chuck;
(f) a second elastomeric gripping ring mounted on said outer circumferential portion of said sliding chuck;
(g) a second pressure plate mounted on said outer circumferential portion of said sliding chuck whereby said second elastomeric gripping ring is sandwiched between said second pressure plate and said flange on said sliding chuck;
(h) means keying said sliding chuck to said hollow shaft to allow reciprocal sliding movement of said sliding chuck on said hollow shaft while preventing rotational movement of said sliding chuck on said hollow shaft;
(i) a thrust member mounted in a bore in said sliding chuck, said thrust member having a threaded bore and having a thrust surface bearing against an end surface of said sliding chuck;
(j) means keying said thrust member to said sliding chuck to prevent said thrust member from rotating within said sliding chuck bore;
(k) a rod disposed in said through bore in said hollow shaft, said rod having a threaded end which threadedly engages said threaded bore in said thrust member, and said rod also having an opposite profiled end which enables rotation of said rod within said through bore of said hollow shaft;
(l) force transmitting means extending between opposed surfaces of said first and second pressure plates; and
(m) rotation of said rod in one direction being operable through said thrust member to move said sliding chuck toward said fixed chuck to cause said pressure plates to compress said elastomeric gripping rings axially by reason of said force transmitting means whereby the outer diameters of said gripping rings are expanded.

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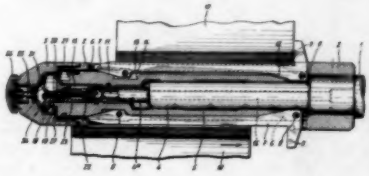
4,422,591

## SHAFT HAVING MEANS FOR RETAINING THEREON A REEL, MATERIAL ROLL OR SIMILAR ARTICLE

Johannes D. van Maanen, Berkel en Rodenrijs, Netherlands, assignor to Teuopharm-Schiedam B.V., Schiedam, Netherlands

Filed Dec. 8, 1981, Ser. No. 328,515
Claims priority, application Netherlands, Jun. 11, 1981, 8102815
Int. Cl.³ B65H 75/24
U.S. Cl. 242—72.1 12 Claims



1. Apparatus for detachably connecting a hollow reel, material roll or similar article on a shaft and to be slipped on the shaft from a free end thereof, said shaft having recesses, said apparatus comprising: a plurality of elongated pressure members located in said recesses and adapted to be displaced radially outwards by means of a pressurized fluid supplied through the shaft from a source of pressurized fluid until said pressure members engage the inside of the reel and also adapted to move radially inwards again for removing the reel from the shaft, each pressure member being mounted in its associated recess also for a slidable movement in axial direction between a first and a second position, and provided at the end remote from the free end of the shaft with a stop projecting radially outwards for shifting the pressure members into the second position by means of the reel slipped on the shaft and engaging the stops, actuating means mounted within the pressure members for axially reciprocating movement between a third and a fourth position, said actuating means being provided with wedge surface means cooperating with wedge surface means formed at said pressure members so that by a movement of the actuating means from said third position to said fourth position the pressure members are urged radially outwards, and means for returning the pressure members radially inwards by a movement of said actuating means to said third position, said actuating means having a stop surface bearing against a stop surface formed at the shaft in said third position of said actuating means, means acting as a spring being provided urging said actuating means to said third position, two spaces being defined in the shaft and communicating with each other through a relatively narrow channel, a first valve member closing said

channel in said third position of said actuating means and the first space communicating with the source of pressurized fluid so that in operation said first space is filled with said pressurized fluid, said second space being defined in part by a substantially transversely extending surface of said actuating means and being provided with a second, normally closed, valve member, said first valve member being coupled to said pressure member such that when said pressure members are moved to said second position the first valve member is opened, so that the pressurized fluid flows into said second space through said channel whereby said actuating means is urged to said fourth position by the fluid pressure acting on said transverse surface for displacing radially the pressure members by means of said wedge surface means by opening said second valve member the fluid pressure in the second space being relieved so that said actuating means is urged to said third position again by said means acting as a spring.

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**4,422,592**

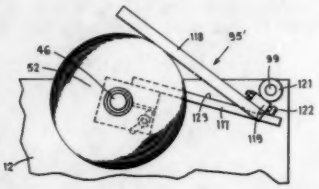
**BRAKE MECHANISM FOR SPOOL**

**Jack G. Swope, St. Ignace, and Harry C. Weiss, Moran, both of Mich., assignors to Rennco Incorporated, Homer, Mich.**

**Filed Jan. 11, 1982, Ser. No. 338,810**

**Int. Cl.**[3] **B65H** *25/28, 25/22;* **B41J** *33/52*

**U.S. Cl. 242—75.45** **8 Claims**




1. In an imprinting apparatus using a ribbon for permitting imprinting of data, said apparatus including a frame, spool-supporting shaft means rotatably supported on the frame and mounting thereon a spool of said ribbon, guide means for movably guiding the ribbon in a preselected path as the ribbon is withdrawn from the spool, imprint means associated with a selected part of the ribbon path, driving means disposed in driving engagement with said ribbon for effecting intermittent and unidirectional displacement of said ribbon along said path and withdrawal of said ribbon from said spool, and brake means associated with said spool for imposing a braking torque thereon for regulating the tension of the ribbon withdrawn therefrom and for preventing overrunning of the spool, said brake means including an elongated follower pivotally supported on said frame and having a part thereof urged into engagement with the outer diameter of the spool for sensing the diameter of said spool and for sensing any decrease in said diameter as the ribbon is withdrawn, said brake means also including a brake member associated with said spool for imposing a braking torque thereon, said brake member having an elongated brake actuating arm associated therewith and projecting therefrom for permitting the braking torque to be varied in response to movement of said actuating arm, and said follower having a cam associated therewith and disposed in contact with said brake actuating arm for transmitting the pivotal movement of said follower to said brake actuating arm so that the braking torque imposed by the brake member on the spool decreases in response to a decrease in the spool diameter, comprising the improvement wherein the brake means includes adjusting means mounted on said follower and including said cam for permitting the rate of brake torque change to be selectively adjusted per unit change in spool diameter without significantly changing or affecting the brake torque imposed on the spool when empty, said brake actuating arm extending approximately radially outwardly from the rotational axis of said spool and defining thereon a substantially planar contact surface which is contacted by said cam, and said adjusting means including mounting means movably supporting said cam on said follower for permitting the initial position of said cam to be adjusted relative to said follower, said mounting means permitting said cam to be movably adjusted along a direction which extends substantially parallel to said contact surface when the follower is in engagement with an empty spool so that the adjustment does not significantly affect the position of said brake actuating arm.

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**4,422,593**

**BELT CLAMPS FOR VEHICLE OCCUPANT RESTRAINT BELT SYSTEMS**

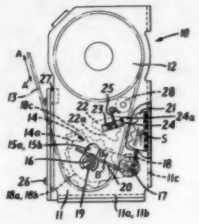
**Juichiro Takada, 3-12-1 Shinmachi, Setagayaku, Tokyo, Japan**

**Filed May 24, 1982, Ser. No. 381,645**

**Claims priority, application Japan, May 29, 1981, 56-081116**

**Int. Cl.**[3] **A62B** *35/02;* **B65H** *75/48, 59/00*

**U.S. Cl. 242—107.2** **10 Claims**




1. A belt clamp for use in a vehicle safety belt system and having a frame, a fixed clamping jaw mounted on the frame adjacent the path of a belt of the system and a movable clamping jaw carried by the frame and engaged by the belt such that it is adapted to be moved in response to tension in the belt toward the fixed clamping jaw to press a segment of the belt against the fixed jaw and restrain the segment from movement, characterized in that at least one stop surface on the frame is engageable by the movable clamping jaw to limit the extent of its movement toward the fixed clamping jaw and in that there is at least one member interposed between the fixed clamping jaw and the frame that is adapted to deform in response to a predetermined tensile load on the belt and thereby allow the belt to slip through the clamping jaws and absorb the kinetic energy of an occupant who is thrust forward against the belt system.

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**4,422,594**

**AUTOMATIC ROLL-UP DEVICE FOR A SAFETY BELT**

**Wolf-Dieter Hönl, Schwäbisch Gmünd, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany**

**Filed Nov. 13, 1981, Ser. No. 320,870**

**Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 3043014**

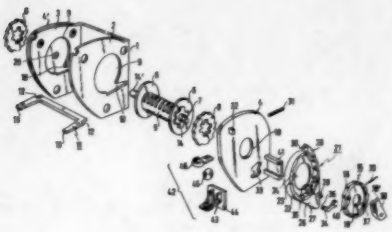
**Int. Cl.**[3] **A62B** *35/02;* **B65H** *75/48*

**U.S. Cl. 242—107.4 A** **9 Claims**

1. Automatic wind-up roller for a safety belt of a vehicle with means to block a belt shaft on which the safety belt is wound in case of danger due to exceeding a predetermined acceleration or deceleration of the vehicle or due to exceeding a predetermined acceleration of belt pullout, comprising a housing, a belt shaft rotatably supported in the housing, a safety belt rolled around the belt shaft, a locking wheel with locking teeth fixed to the belt shaft and rotatable therewith, a locking detent adapted to engage the locking teeth of the locking wheel to block the belt shaft in case of danger but normally out of engagement with the locking teeth, a control

part rotatably supported on the belt shaft rotatable from a rest position to a locking position in which the control part moves the locking detent in engagement with the locking teeth of the locking wheel, a support member fixed to the belt shaft for moving the control part to its locking position, said support member having locking teeth, and an operating lever mounted on the control part and movable to engage the locking teeth of the support member,

(a) a vehicle-sensitive inertia sensor which activates said operating lever mounted on the control part to move to



engage the locking teeth of the support member when a predetermined acceleration or deceleration of the vehicle is exceeded, the support member through said engagement of the operating lever moving the control part to its locking position,

(b) a belt-sensitive inertia sensor attached to said support member which sensor engages the control part when the belt pullout exceeds a predetermined acceleration, the support member through said engagement of said sensor moving the control part to its locking position.

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**4,422,595**

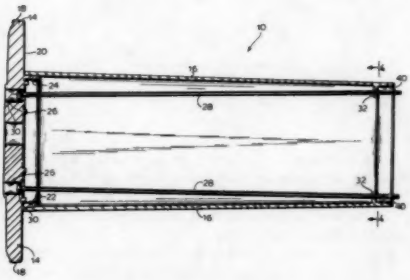
**STUD HOLDERS FOR REEL ASSEMBLY**

**Alvin D. Thomas, Valatie, N.Y., assignor to Albany International Corp., Menands, N.Y.**

**Filed Jan. 19, 1982, Ser. No. 340,737**

**Int. Cl.³ B65H** *75/14, 75/22*

**U.S. Cl. 242—116** **5 Claims**



1. A reel for wire or the like, comprising:

a hollow elongated barrel having an interior area;

a first and second flange disposed on respective ends of the barrel;

a plurality of bolt means for maintaining the flanges on the ends of the barrel, said first flange having respective receptacles for a first end of the respective bolt means to be secured thereto, said second flange having respective receptacles for an opposite second end of the respective bolt means to be secured thereto, said bolt means being disposed in said respective receptacles and through said barrel securing said flanges to the barrel; and

alignment means disposed on the interior area of the barrel comprising stud holders formed as respective open notched members so as to allow the lateral snap fitting of the bolt means therein and the alignment of the respective bolt means after the insertion of the bolt means into the barrel and accordingly allow for fixedly aligning the respective second ends of the bolt means with respective receptacles in the second flange means thereby facilitating the securing of the second flange to the barrel.

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**4,422,596**

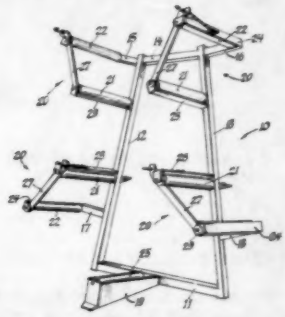
**DISPENSING REEL**

**Thomas H. Clevenger, Chicago, Ill., assignor to Clevenger Associates Inc., Chicago, Ill.**

**Filed Sep. 27, 1982, Ser. No. 424,864**

**Int. Cl.³ B65H** *49/00*

**U.S. Cl. 242—129** **6 Claims**



1. A large capacity dispensing reel for coils of plastic pipe and tubes and the like comprising,

(a) a skeleton frame comprising a base and a pair of vertically extending converging trunk members,

(b) a series of upwardly inclined limbs extending in opposite directions from said trunk members,

(c) a plurality of open core coil retention units supported by said trunks and said limbs and extending to one side of said frame,

(d) said retention units comprising open core coil supporting members,

(e) a movable coil latch arm provided by each of said retention units for retaining a segment of the coil within each of said retention units, and

(f) a releasable latch for locking said latch arms in position for retaining the open core coil within said retention units.

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**4,422,597**

**CARRIER DEVICE FOR TWISTER OR BOBBIN TUBES**

**Ulrich Lossa, Krefeld, Fed. Rep. of Germany, assignor to Palitex Project-Company GmbH, Krefeld, Fed. Rep. of Germany**

**Filed Nov. 13, 1981, Ser. No. 320,855**

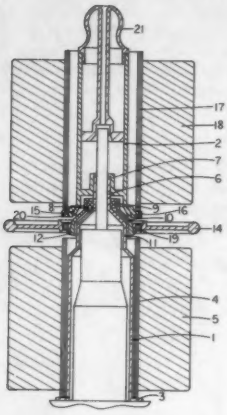
**Claims priority, application Fed. Rep. of Germany, Dec. 10, 1980, 3046449**

**Int. Cl.³ B65H** *49/00*

**U.S. Cl. 242—130** **10 Claims**

1. A carrier device for at least two twister or bobbin tubes comprising; a substantially sleeve-shaped carrier member for carrying said tubes stacked axially one above the other, said carrier member having a central region, a first support surface on said central region, said central region having a circumference, the lower tube of said axially stacked tubes having an inner circumference such that the central region provided with a smaller circumference than the inner circumference of said lower twister tube enables the lower twister tube to be slipped

onto said carrier member in an axial condition without disassembling, and an annular pull-off aid having a continuous



circumferential thread engaging surface releasably supported on said first support surface.

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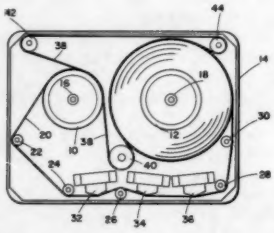
**4,422,598**
**EXTREME TEMPERATURE TAPE RECORDER DRIVE BELT**

**Johannes B. Groenewegen, Kirkland, and Stephen M. Meginniss, III, Seattle, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.**

**Filed Jun. 9, 1981, Ser. No. 271,764**
**Int. Cl.³ G03B *1/04*; F16H *55/36***
**U.S. Cl. 242—192** **2 Claims**



**1**. A drive belt for abuting and driving magnetic tape and tape reels in a magnetic tape recorder comprising: a silicone rubber including a silicone polymer chain; and substituent groups on the polymer chain.

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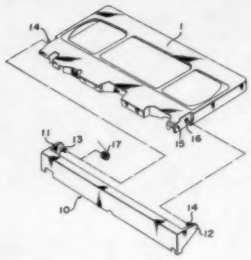
**4,422,599**
**MAGNETIC TAPE CASSETTE**

**Masatoshi Okamura, and Haruo Shiba, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan**

**Filed Nov. 19, 1981, Ser. No. 323,080**
**Claims priority, application Japan, Feb. 9, 1981, 56-16864[U]**
**Int. Cl.³ G03B *1/04*; G11B *15/32, 23/04***
**U.S. Cl. 242—198** **3 Claims**

**1**. A magnetic tape cassette comprising:
an upper half casing having first and second sides and a front defining a tape travel path;
a hole in each of said sides;
a guard panel having two ends, each of said ends including a pin;
a guide groove in each of said sides, each said guide groove defining an area including one of said holes and extending toward said front, the width of each said groove increas-



ing toward said front, wherein each said guide groove includes a chamfered edge,
whereby each of said pins is guided into one of said holes so that said guard panel is pivotally supported on said half casing.

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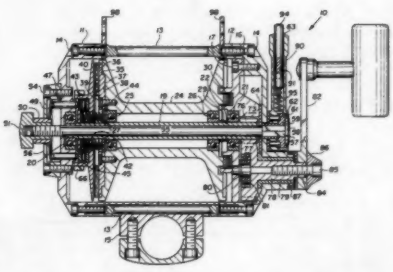
**4,422,600**
**FISHING REEL**

**Robert Preston, 3081 N.W. 47th Ter., Apt. #307, Lauderdale Lakes, Fla. 33331**

**Continuation-in-part of Ser. No. 265,683, May 20, 1981, abandoned. This application Sep. 27, 1982, Ser. No. 423,703**
**Int. Cl.³ A01K *89/02***
**U.S. Cl. 242—217** **4 Claims**



**4**. In a fishing reel of the type comprising a body, a spool rotatably supported in said body, a spool-driving and braking device including a friction coupling, an actuating device for actuating said friction coupling, the improvement wherein said actuating device comprises:
(a) a pressure adjustment lever containing a cavity and a lever aperture, said pressure adjustment lever mounted exteriorly on said body for manual manipulation, said aperture intersecting said cavity,
(b) a pin containing a pin aperture, said pin positioned in said cavity,
(c) an arcuate strip, said arcuate strip affixed to said body in a spaced relationship and passing through said lever and pin apertures,
(d) a yieldable member positioned in said cavity and urging said pin against said arcuate strip,
(e) at least one projection formed on said arcuate strip and positioned in the path of contact traced out by said pin on said arcuate strip as said pressure adjustment lever is manipulated, said projection of a shape for stopping manipulation of said pin and pressure adjustment lever in at

least one direction and for permitting said pressure adjustment lever to pass beyond said stopping position by manual urging of said pin against said yieldable member and out of contact with said arcuate strip.

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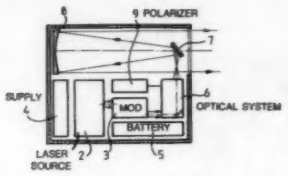
**4,422,601**

## SYSTEM FOR GUIDING A MISSILE BY MODULATED LIGHT BEAM

**Jean C. Chavany, Chatenay-Malabry, and Wladimir Koreicho, Chilly-Mazarin, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France**

**Filed Jan. 23, 1981, Ser. No. 227,603**
**Claims priority, application France, Jan. 29, 1980, 80 01841**
**Int. Cl.³ F41G 7/26**
**U.S. Cl. 244—3.13** **7 Claims**




1. In a system for guiding a missile in a direction of sight, comprising, at emission, a source of emission producing a light beam of which the axis defines the direction of sight and a device for modulating the beam emitted, and on the missile, at least one photo-detector and a processing circuit for determining, from the output signal from the detector, at least one coordinate of the missile with respect to the direction of sight, said coordinate being applied to the control surfaces of the missile in order to control the path of the missile on the direction of sight, characterized in that the modulation device comprises a sight in the form of a band comprising repetitive motifs, a movement of translation at constant speed being created between the beam and the sight, in a direction perpendicular to the axis of the beam, each motif comprising opaque and transparent parts, the opaque and/or transparent parts having a length (measured in the direction of displacement) which varies according to the height in question, and a time base is provided for determining the two coordinates of the missile, wherein the sight is a hollow drum rotated about its axis and a reflecting member is placed at the centre of the sight so as to reflect the beam arriving along the axis of the sight, in a radial direction with respect to the sight.

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**4,422,602**

## TRIPOD TYPE LANDING GEAR

**Andre Turiot, Morsang S/Orge, France, assignor to Messier-Hispano-Bugatti (S.A.), Montrouge, France**

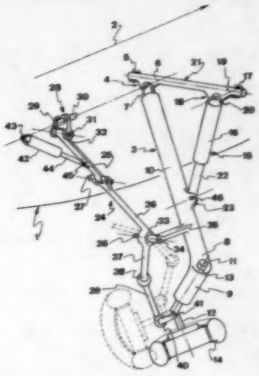
**Filed Mar. 24, 1982, Ser. No. 361,218**
**Claims priority, application France, Mar. 27, 1981, 81 06155**
**Int. Cl.³ B64C 25/10**
**U.S. Cl. 244—102 R** **7 Claims**

1. Retractable landing gear of the tripod type for a rigid-frame aircraft, comprising:

a leg capable of being connected on a first end at a first fixed point of the aircraft frame via a first cardan joint to first and second pins, including means for mounting said leg rotatably around the second pin, the other end of said leg supporting a pivoting pin on which can be mounted a rolling means,

a shock abdsorber of which one end can be connected at a second fixed point of said frame via a second cardan joint to third and fourth pins including means for mounting said shock absorber rotatably around the fourth pin, the other end of said shock absorber being rotatably connected at a point on said leg around a fifth pin, said point on said leg being located near the aforesaid pivoting pin,

a strut of which one end is capable of being connected at a third fixed point of said frame via a third cardan joint to sixth and seventh pins including means for mounting said strut rotatably around the seventh pin, the other end of said strut being connected to said leg through an eighth pin substantially near said pivoting pin, said strut being made up of at least two levers pivoting in relation to each other around a nineth pin,



connection means between the end of said strut cooperating with the eighth pin and said pivoting pin supporting the rolling means, and

means for controlling the alignment of the two levers of said strut, with said first, third, seventh, eight and ninth pins being parallel in one direction, and the second, fourth, fifth and sixth pins being parallel in a second direction with said two directions forming a non-zero angle between them.

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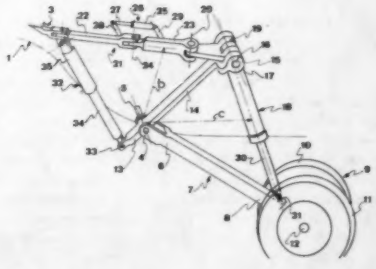
**4,422,603**

## LANDING GEAR FOR AIRCRAFT

**Andre Turiot, Morsang S/Orge, and Michel Derrien, Versailles, both of France, assignors to Messier-Hispano-Bugatti (S.A.), Montrouge, France**

**Filed Mar. 2, 1982, Ser. No. 354,009**
**Claims priority, application France, Mar. 5, 1981, 81 04421**
**Int. Cl.³ B64C 25/14**
**U.S. Cl. 244—102 R** **13 Claims**



1. Retractable landing gear actuated between two positions, respectively the retracted and extended positions, for a rigid-frame air craft, said landing gear comprising: a lever mounted rotatably on a first pin at a first attachment point incorporated

in the frame and forming a first pivot axis, a rocker beam mounted rotatably at one end on a second pin incorporated in said frame at said first attachment point, a "breaking" strut mounted rotatably at a first of its ends onto a second attachment point incorporated in said frame and including at least two alignable parts, connecting means for linking the other end of said strut to said lever at a second point thereof defining a second pivot axis, controllable means for "breaking" the alignment of said strut parts, a shock absorber connecting said second point of said lever to a second point of said rocker beam and means for applying a controllable pivoting force to said lever.

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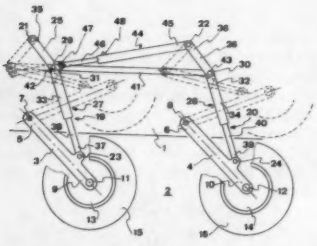
**4,422,604**

## FUSELAGE LANDING GEAR WITH TANDEM WHEELS

**André Turiot, Morsang S/Orge, and Michel Derrien, Versailles, both of France, assignors to Messier-Hispano-Bugatti (S.A.), Montrouge, France**

**Filed Mar. 2, 1982, Ser. No. 354,010**
**Claims priority, application France, Mar. 5, 1981, 81 04420**
**Int. Cl.³ B64C *25/14***
**U.S. Cl. 244—102 R** **12 Claims**



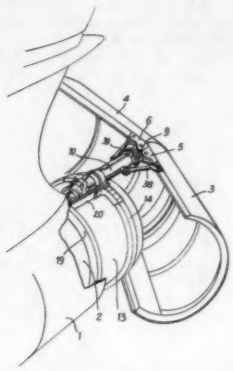
1. Landing gear of the so-called fuselage type with wheels mounted in tandem for an aircraft having a rigid structure, said landing gear comprising; at least two rocker beams, means for mounting one of the ends of said beams, respectively around two first and second pivot axes incorporated in the structure of the aircraft, means for supporting rolling means on the other ends of said rocker beams, first and second connection means connected between first and second points respectively on the two said rocker beams to third and fourth pivoting points incorporated in the structure of said aircraft, each of said first and second connection means comprising a lever and a shock absorber connected to each other on one of their ends by a pivoting point, the ends of the two levers rotating together with the third and fourth points respectively, the other ends of the shock absorber being respectively connected to the first and second points, a connecting rod of constant length linking the two levers, means for applying a force on at least one of the two said levers, said means for applying a force on at least one of the two said levers consisting of an actuating cylinder having a first end connected in rotation to a rigid point of the aircraft structure, means for applying the force of the second end of said actuating cylinder to at least one lever, said actuating cylinder taking on at least two positions determining two limit lengths, said two limit lengths corresponding respectively to retracted and extended positions of the landing gear, and wherein the first end of said actuating cylinder is fixed on one said third and fourth points incorporated in the rigid structure of the aircraft.

**4,422,605**

## REVERSER FOR JET ENGINE

**Etienne Fage, Jouy-en-Josas, France, assignor to Societe ASTECH, Meudon la Foret, France**

**Filed Sep. 10, 1981, Ser. No. 300,989**
**Claims priority, application France, Nov. 27, 1980, 80 25168**
**Int. Cl.² B64D *33/04***
**U.S. Cl. 244—110 B** **5 Claims**



1. In a thrust reverser for a jet engine of an aircraft comprising at least one door mounted to pivot about an axis which is transverse and substantially diametrical with respect to the jet of said engine and which is located downstream of the exhaust nozzle thereof, said door being pivotable between a folded position in which it is clear of, said jet and an extended position in which it is arranged transversely with respect to said jet, and a control device for controlling the position of said door, said control device including at least one longitudinal jack and at least one connecting rod interconnecting said jack and said door,

the improvement comprising:

at least one locking device adapted to lock said door in folded position, said locking device being effective to unlock said door to permit passage from its folded position to its extended position only after said door has been brought into a super-retracted position with respect to said folded position, and

at least one stop means which allows said door to pass from said folded position to said super-retracted position only when the power output of said engine is lower than a predetermined threshold valve close to idling.

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**4,422,606**

## AUTOMATIC LEADING EDGE SLAT FOR AIRCRAFT

**Ronald G. Munroe, P.O. Box 317, Georgetown, S.C. 29440**

**Filed Jun. 25, 1981, Ser. No. 277,353**
**Int. Cl.³ B64C *13/16***
**U.S. Cl. 244—203** **16 Claims**

1. A leading edge slat assembly for an aircraft wing comprising:

(a) a lower strip attachable to said wing in a position in which the lower strip projects forwardly from the leading edge of the wing;

(b) an upper strip overlying the lower strip in spaced relation thereto, said upper and lower strips having leading edge portions that are spaced apart forwardly of the leading edge of the aircraft wing to which the lower strip is attached, the upper strip having a trailing edge portion adapted to overlie the upper surface of the leading edge portion of the wing; and

(c) spring elements connecting the respective strips at spaced locations along the lengths thereof, said spring elements being tensioned to normally hold the rear edge portion of the upper strip in contact with the upper surface of the wing, while being adapted to resiliently yield in the presence of ram air directed through the space between the leading edges of the strips, for biasing of the upper strip away from the wing by the ram air to allow passage of the ram air along the top surface of the wing, the spring elements constituting the sole means connecting the strips, said leading edge portions of the strips being at all times vertically spaced apart throughout their lengths by the spring elements to define a continuously open space therebetween, the strips being relatively formed and located to require that the space open downwardly in generally level attitudes of the wing to prevent ram air from entering the space, and to open forwardly when the wing is inclined, to permit said entry.

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**4,422,607**

## CLIMBING CHOCKS

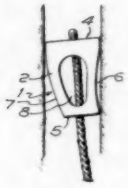
**Mark Vallance, Crest Cottage, Great Hucklow, Tideswell, Derbyshire S17 8RF, England**

**Filed Oct. 6, 1980, Ser. No. 193,912**

**Claims priority, application United Kingdom, Oct. 11, 1979, 7935322**

**Int. Cl.³ F16M *13/00***

**U.S. Cl. 248—1** **8 Claims**



1. A climbing chock for positioning in a crack in a rock formation comprising a generally wedge shaped body including four side faces, two opposite side faces of which are respectively of concave and convex configuration, said body also being formed with longitudinal passageway means extending in the direction and within the confines of said side faces through which a line is passed, whereby the applied force along said line allows said concave and convex faces to move toward engagement with the sides of the crack while resisting pivoting action so as to tend to cause secure three point engagement of said chock.

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**4,422,608**

## PANEL HANGER

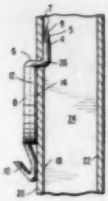
**James W. Hogg, Nashville, Tenn., assignor to Anchor Wire Corporation of Tennessee, Goodlettsville, Tenn.**

**Filed May 29, 1981, Ser. No. 268,499**

**Int. Cl.³ A47F *5/00***

**U.S. Cl. 248—205 A** **12 Claims**

1. In a hanger for suspending articles from a vertical panel having a front and rear surface, said device comprising a disc having a front and rear surface and a wire having an upwardly projecting needle point penetrator portion disposed in a plane parallel with the planes of said disc's front and rear surfaces to permit forcible insertion through said panel and by manipulation to abut against the panel's rear surface thereof to prevent removal of the hanger, a foot portion projecting outwardly from the lower end of said penetrator portion and at a substantially right angle thereto to extend between the front and rear surfaces of said panel to provide support against vertical movement, that portion of said wire extending forwardly through said front surface of the panel when said penetrator portion



abuts against said rear surface being connected to said disc to press said disc against said front surface of the panel, said wire further depending downwardly from said foot portion to define a shank, said shank defining a hook at its lower end, said disc having a rear surface provided with an adhesive covering for adhesion to the front surface of said panel to prevent relative movement of said disc.

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**4,422,609**

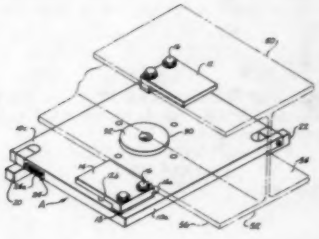
## CLAMP-MOUNT DEVICE

**Keith H. Clark, Decatur, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Aug. 14, 1981, Ser. No. 293,414**

**Int. Cl.³ A47B *96/06*; E04G *3/00***

**U.S. Cl. 248—228** **7 Claims**



1. A clamp-mount device for mounting equipment to an associated I-beam and the like structural member of the type having oppositely extending flanges, said device comprising:

a base;

a pair of oppositely facing clamping members carried diagonally on said base clamping said flange therebetween and having flange receiving openings facing one another;

lock means carried diagonally by said base opposite said clamping members locking said flanges in said clamping members;

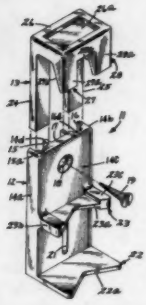
resilient hub means carried centrally of said base engaging and biasing a back side of said flanges maintaining same tightly clamped, said base turning about said hub means to receive said flanges within said clamping members; and

means securing said equipment to said base.

## 4,422,610
## FLOWER POT HOLDER

Vicki L. Hunt, Clearwater, Fla., assignor to Ron-Vik, Incorporated, Minneapolis, Minn.

Filed May 11, 1981, Ser. No. 262,312
Int. Cl.³ A47K 1/08
U.S. Cl. 248—311.2 17 Claims



1. A device for releasably mounting a flower pot having a frustoconical side wall and a stepped collar at the top of the side wall, the device comprising:

(a) a base member capable of vertical orientation and defining front and back faces, the base member comprising

(i) first and second abutment means projecting laterally from said front face in vertical spaced relation;

(ii) the first abutment means being constructed and disposed to underlie and engageably support the bottom edge of said stepped collar;

(iii) the second abutment means being constructed and disposed to be engaged by and laterally support the frustoconical wall of the flower pot;

(b) and clamping means associated with the base member, the clamping means being movably adjustable relative to the base member to define a retaining enclosure with said first abutment means;

(c) and locking means for maintaining the clamping means and support means in a predetermined fixed relative position.

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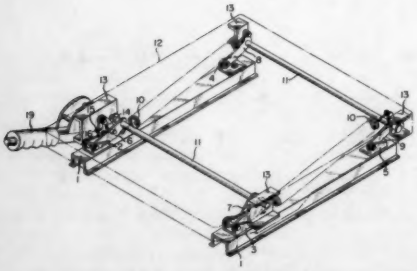
## 4,422,611
## LIFTABLE DRIVER'S SEAT FOR AUTOMOBILES

Minoru Kitsuda, 3-5, Nishi Yahata 1-chome, City of Hiratsuka, Kanagawa Prefecture, Japan

Filed Sep. 11, 1981, Ser. No. 301,388
Int. Cl.³ E01B 7/00
U.S. Cl. 248—421 8 Claims



1. A liftable driver's seat for automobiles comprising a seat frame having substantially a rectangular shape in the plan view, bearing block means disposed near the four corners of said seat frame so as to be rigidly secured thereto, link means pivotally connecting said bearing means to the floor of said automobile so as to be elongated in substantially the same direction, a main rotary shaft means rotatably supported by one of said bearing blocks, a pair of operating links pivotally connected together at one of their end portions, with the other end of one of said operating links being fixedly secured to said main rotary shaft, the other end of the other of said operating links being pivotally connected to one of said link means disposed near said bearing block which rotatably supports said main rotary shaft, and a manipulating lever means having generally a hollow cylindrical form and detachably secured to said main rotary shaft, said manipulating lever means is provided with a stopper means which is adapted to coact with a counter element secured to said bearing block which rotatively supports said rotary shaft such that said stopper means usually prevents said rotary shaft from being rotated in association with said counter element, but whereby, when said stopper means is separated from said counter element, said main rotary shaft is allowed to be rotated by said manipulating lever means.

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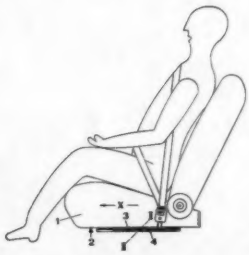
## 4,422,612
## DEVICE FOR SUPPORTING A MOVEABLE SEAT, FOR EXAMPLE IN A MOTOR VEHICLE

Simon Frank, Watterdingen, Fed. Rep. of Germany, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed May 28, 1982, Ser. No. 382,901
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1981, 3122124
Int. Cl.³ F16M 13/00
U.S. Cl. 248—430 6 Claims



1. A sliding rail arrangement for supporting a moveable seat in a motor vehicle comprising:

a substantially U-shaped alignment rail secured to said motor vehicle wherein each leg of said substantially U-shaped alignment rail is provided with first and second spaced apart continuous flanges; and

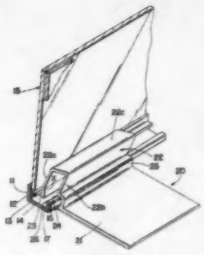
a substantially U-shaped sliding rail slidably received within said substantially U-shaped alignment rail wherein each leg of said U-shaped sliding rail is provided with third and fourth spaced apart continuous flanges extending toward and proximate to said first and said second continuous flanges respectively such that one of said first continuous flange and said third continuous flange is below the other so as to define a first pair of continuous flanges and one of said second continuous flange and said fourth continuous flange is below the other so as to define a second pair of continuous flanges wherein one of said first pair of continuous flanges and said second pair of continuous flanges define a bearing surface for receiving a bearing and the other of said first pair of continuous flanges and said second pair of continuous flanges abut each other when said sliding rail is overloaded.

4,422,613

## PICTURE FRAME EASELS

Nicholas K. Cray, Schiller Park, Ill.; Frederick L. Murrin, and Phillip E. Maupin, both of Greenville, Pa., assignors to R. D. Werner Co., Inc., Greenville, Pa.

Filed Jun. 18, 1982, Ser. No. 389,846
Int. Cl.³ A47F 7/14
U.S. Cl. 248—473 9 Claims



1. An easel for detachably supporting and mounting a back-loading picture frame of channel shape having upstanding front and rear faces, said easel comprising a flat land member adapted to underlie said frame, a resilient yoke member secured to said land member and including a pair of spaced legs disposed in angled relation to said land member, said legs and said front and rear faces of the frame having means associated therewith adapted to contact the said legs whereby the legs are adapted to be lockingly retained in spring pressed relation against said front and rear faces and removable therefrom by exertion of pressure upon said legs.

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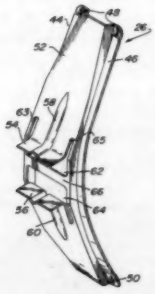
4,422,614

## SUPPORT MEANS FOR A PLURALITY OF SOLAR PANELS

Gerard R. Santos, Levittown, Pa., assignor to The Budd Company, Troy, Mich.

Filed Aug. 27, 1981, Ser. No. 296,797
Int. Cl.³ B60R 1/02
U.S. Cl. 248—475 R 3 Claims



1. Support means for holding a plurality of curved solar panels comprising:

(a) a main metal tubular support structure extending along the length of the solar panels to be supported;

(b) a plurality of support members for receiving said plurality of solar panels thereon connected to said main tubular support structure;

(c) each of said support members comprising an elongated integral metal sheet curved to receive said solar panels on one side and including projecting sections on the opposite side welded to said tubular support structure;

(c) each of said support members being adapted to receive and hold two adjacent solar panels and including longitudinally disposed edges including a plurality of apertures therein to permit fastening means to be connected therethrough to hold said solar panels;

(e) each of said support members further including a solid section between said protruding sections with each of said protruding sections including a centrally disposed indent portion to add strength thereto; and

(f) each of said support members still further including a pair of apertures at opposite ends thereof with said support members overlapping adjacent solar panels so that one aperture of each said pair is aligned with one solar panel.

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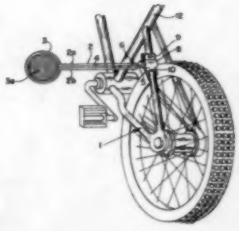
4,422,615

## FLEXIBLE REFLECTOR ASSEMBLY FOR BICYCLES AND THE LIKE

Henry E. McManus, Box 543, 60 Woodhaven Dr., Belchertown, Mass. 01007

Filed May 21, 1982, Ser. No. 380,331
Int. Cl.³ B60R 1/06
U.S. Cl. 248—475 R 6 Claims

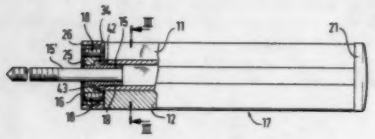


1. An attachment for a bicycle or the like comprising of an extension arm, said extension arm having two parallel members, a strut connecting the said parallel members, a reflector member at the end of said arm between the said parallel members, a fulcrum swivel mount assembly, means located at the opposite end of said arm from said reflector member for connection with said fulcrum swivel mount assembly, a fulcrum clamp, said fulcrum clamp adapted to be fastened to said fulcrum swivel mount assembly, a bicycle clamp being adapted to be fastened to a frame member of a bicycle, said fulcrum clamp being an integral part of the body of said bike clamp, a reflector adapted to be mounted on said reflector member whereby said extension arm may be rotated forward or backward on said fulcrum mount and whereby said extension arm may be rotated about its own axis 360°, said fulcrum swivel mount assembly comprises of a fulcrum cylinder, a tongue having flat upper and lower surfaces and extending outwardly from said fulcrum cylinder, pivot mounts protruding upwardly and downwardly from said upper and lower tongue surfaces, a fulcrum cutout in each segment of said parallel segments of said extension arm adapted to mount said pivot mounts therein, said fulcrum cylinder adapted to be inserted within said fulcrum cylinder and adapted to be inserted within said fulcrum clamp.

## 4,422,616
## SUPPORT ARM FOR FASTENING TO A WALL

Rudolf Wilke, Arolsen; Horst Jäger, Edertal, and Winfried Scholl, Düsseldorf, all of Fed. Rep. of Germany, assignors to Rudolf Wilke, et al., Fed. Rep. of Germany

Filed Feb. 1, 1980, Ser. No. 117,721
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1979, 2905031
Int. Cl.³ A47B 57/04, 96/14
U.S. Cl. 248—544 25 Claims

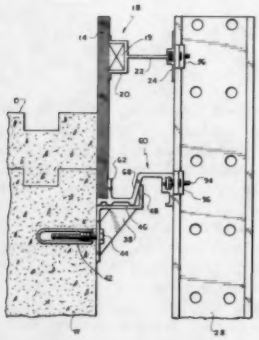


1. A support arm assembly for fastening to a wall, said assembly comprising a support arm, a pressure plate bearing on the wall, a securing screw having a threaded end passing substantially centrally through said pressure plate for engagement in said wall and a head end located outside said wall for carrying said support arm, flange means axially facing said pressure plate and being adapted to exert a bending moment on said securing screw, and at least three adjustment screws spaced around said securing screw and acting between said pressure plate and said flange means so that on rotation of each said adjustment screw the distance between said flange means and said pressure plate is varied at the location of that screw, thereby tilting the flange means relative to the wall and thus exerting said bending moment on said securing screw and deflecting the same to align said head end and said support arm relative to said wall.

## 4,422,617
## EDGE JOIST

Anthony J. Gallis, Lake Hiawatha, N.J., assignor to Harsco Corporation, Camp Hill, Pa.

Filed Jan. 15, 1982, Ser. No. 339,776
Int. Cl.³ E04G 11/60
U.S. Cl. 249—19 12 Claims

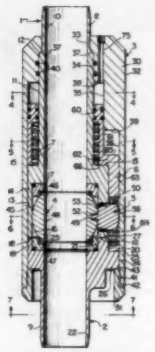


1. An edge joist for use in a wallform system including at least one sheathing panel, joists extending in one direction along said panel for supporting the same, and strengthening walers extending in a generally perpendicular direction behind said joists for supporting the same to form a joist system, the edge joist comprising a metal S-beam and having an upright front flange engageable with a rear surface of said upright sheathing panel with a lower edge of the front flange to be disposed substantially at a straight edge of the panel, a rear flange generally parallel to said front flange, a protective toe plate extending forward from the lower edge of the front flange, and a stepped angled web extending from adjacent said lower edge of said front flange to adjacent an upper edge of said rear flange.

## 4,422,618
## REMOTELY OPERATED VALVE

John E. Lawson, London, England, assignor to Armco Inc., Middletown, Ohio

Filed Dec. 1, 1981, Ser. No. 326,331
Int. Cl.³ F16K 31/12, 31/54
U.S. Cl. 251—58 13 Claims



1. In a remotely operable valve, the combination of
a first valve body member having
a first end portion dimensioned to be secured to an end of a first fluid-conducting member,
a through bore concentric with a first longitudinal axis, and
a second end portion which is hollow and has an inner wall concentric with the first axis,
the second end portion having an outer surface concentric with a second longitudinal axis spaced laterally from and parallel to the first axis,
the second end portion also including a lateral opening which is radial with respect to the first and second axes,
a portion of the first valve body member between the first and second end portions having a longitudinal outer surface which is cylindrical and extends parallel to the first axis;
a second valve body member having
a first end portion dimensioned to be secured to an end of a second fluid-conducting member,
a second end portion, and
a through bore,
the second body member being disposed with its second end portion opposed to the second end portion of the first body member and with its through bore concentric with the first longitudinal axis;
a housing surrounding the first and second body members and securing the body members together in end-to-end relation with the second end portions of the two body members defining a cavity with which the through bores and said lateral opening communicate, the housing having
a first inner surface portion which is spaced outwardly from the longitudinal outer surface of the first body member and extends parallel to the first axis, and
a second inner surface portion spaced outwardly from that portion of the outer surface of the second end portion of the first body member through which the lateral opening extends;
a rotary movable valve member disposed in the cavity and movable between a first position, in which the through

bores of the first and second body members are in communication, and a second position, in which the movable valve member prevents flow between the through bores;

an actuating member comprising

a pinion disposed within the space between the second inner surface portion of the housing and the outer surface of the second end portion of the first valve member, and

a shank journalled in the lateral opening in the second end portion of the first body member and connected to the movable valve member to rotate the same when the pinion is rotated;

a combined piston and rack member comprising

an annular piston disposed between and slidably engaging said longitudinal outer surface of the first body member and the first inner wall portion of the housing, the annular piston coacting with the first body member and the housing to define an expansible chamber, and

a rack extending longitudinally within the space between the second end portion of the first body member and the second inner wall portion of the housing and operatively engaged with the pinion;

the combined piston and rack member being yieldably biased longitudinally in one direction; and

a flow conduit arranged to supply pressure fluid to the expansible chamber to drive the combined piston and rack member in the opposite direction.

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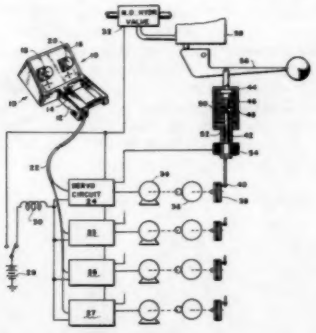
**4,422,619**

## REMOTE VALVE OPERATING SYSTEM

**Edward E. Griffiths, 3200 Polaris St., No. 23, Las Vegas, Nev. 89102**

**Filed Jul. 21, 1981, Ser. No. 285,520**
**Int. Cl.³ F16K *31/05***
**U.S. Cl. 251—130** **8 Claims**



1. A remote control system for remotely controlling the movement and position of a manually operable mechanism, said control system comprising:

a remote control unit including a manually operable deadman switch and a manually adjustable remote control potentiometer for generating a control signal;

a drive motor;

a motor position sensing potentiometer coupled to said drive motor and positioned by the rotation of said drive motor for generating a position signal;

solenoid controlled interconnecting means coupled to the output of said drive motor and to the manually operable mechanism for positioning said manually operable mechanism in response to rotation of said drive motor;

a servo circuit coupled between said drive motor and said remote control unit and responsive to said control signal from said manually adjustable remote control potentiometer and said position signal from said motor position sensing potentiometer for rotating said motor to a position where said position signal corresponds to said control signal;

a solenoid control circuitry controlled by said servo circuit for actuating said solenoid controlled interconnecting means during operation of the remote control system; and

safety circuitry within said servo circuit for disabling said solenoid control circuitry and for returning said drive motor to a predetermined neutral position whenever said control signal exceeds predetermined upper and lower voltage limits.

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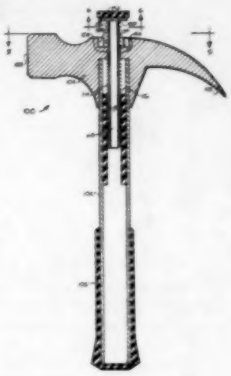
**4,422,620**

## ADJUSTABLE FULCRUM HAMMER

**Jerold I. Nitzberg, 3029 Fleetwood Ave., Baltimore, Md. 21214**

**Continuation-in-part of Ser. No. 238,956, Feb. 27, 1981, abandoned. This application Apr. 5, 1982, Ser. No. 365,866**
**Int. Cl.³ B25C *11/00***
**U.S. Cl. 254—26 E** **6 Claims**



1. An adjustable fulcrum hammer comprising in combination:

a handle having a grip at one end for manually grasping said handle and an interior cavity extending into said handle from the opposing end;

a claw hammer head having a striking surface and claw and rigidly fixed about said other end of said handle with said striking surface and said claw extending outwardly from said handle, said head having a bore extending therethrough from the upper surface and axially communicating with said cavity;

an elongated fulcrum rod extending through said bore and into at least a portion of said cavity having a flange member rigidly fixed to one end thereof and being capable of turning movement between locked and unlocked positions; and

means for reciprocably adjusting the position of said rod between extended and retracted positions relative to said head and for locking said rod in predetermined positions, said adjusting and locking means including a pair of opposing first threaded portions associated with said bore and a pair of second opposing threaded portions associated with said rod, said rod further including a pair of opposing parallel planar surfaces extending along the length of said rod thereby defining together with said first threaded portions the perimeter of said rod, said bore further including means defining surfaces which together with said second threaded portions define an aperture with which said rod perimeter slidably cooperates in said unlocked position so as to permit reciprocal movement of said rod between said extended and retracted positions thereof, said first and second threaded portions matingly engaging one another so as to securely lock said rod rela-

tive to said head when said rod is turned from said unlocked position to said locked position.

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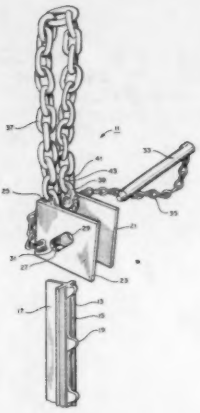
**4,422,621**

## FENCE POST PULLER

Paul B. Ekern, P.O. Box 1830, Vernon, Tex. 76384

Filed Feb. 11, 1982, Ser. No. 347,994
Int. Cl.³ E21B *19/00*
U.S. Cl. 254—30 2 Claims



1. A device for use in pulling metal fence posts of the type having a flange and shank formed perpendicular to each other to define a T-shaped cross-section, and lugs spaced along the flange, comprising:

a pair of side plates connected together by a cross-member at the rear and spaced for placement around a post with the shank between and parallel with the plates;

locking means connecting the plates forward of the cross-member for engaging one of the lugs upon application of an upward force on the device; and

a looped chain for receiving the upward force, the chain having a plurality of links, with one of the links on each end being rigidly mounted to and perpendicular with each plate on the inner side of each plate between the cross-member and the locking means, defining a space between them for receiving the shank.

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**4,422,622**

## PREFABRICATION FENCE PANEL CONSTRUCTION FOR DOG KENNELS AND THE LIKE

Stanley M. Broski, Jr., Kansas City, Mo., assignor to Merchants Metals, Inc., Forth Worth, Tex.

Filed Dec. 21, 1981, Ser. No. 332,498
Int. Cl.³ E04H *17/16*
U.S. Cl. 256—25 1 Claim

1. An upright, free-standing enclosure, comprising:

a plurality of fence panels, each including—

a top rail;

a bottom rail;

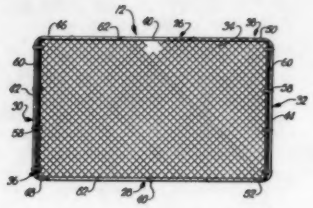
a pair of upright side rails each having an upper and a lower end;

the end margins of said top, bottom and side rails being integral with the major portion of the corresponding rails and configured for telescopic interfitting of the opposed ends of said top rail with the upper ends of the respective side rails, and for telescopic interfitting of the opposed end of said bottom rail with the lower ends of said respective side rails, to define an interconnected, continuous panel perimeter having a desired length and height;

a section of fencing fabric;

means for securing said fabric section to said interconnected perimeter-defining rails, and for subjecting said telescopically interfitted rail ends to forces tending to pull said top, bottom and side rails together, whereby said panel construction is structurally self-sustaining;

frame structure including telescopically interfitted, top, bottom and side rails presenting a continuous frame circumscribing and defining a gateway;



a gate configured to fit within said frame structure;

hinge means securing said gate within said frame structure; and

means rigidly interconnecting adjacent, upright side rails of said plurality of fence panels and said frame structure for presenting a free-standing enclosure free of permanently set posts or the like, including rigid connectors directly coupled to said adjacent side rails and spanning the distance therebetween.

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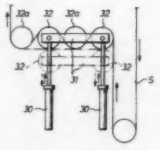
**4,422,623**

## APPARATUS FOR COOLING STEEL STRIPS TO EFFECT CONTINUOUS ANNEALING

Hiroshi Kuroda, Tokyo; Yoshikazu Fukuoka, Fukuyama; Hiroshi Naemura, Fukuyama, and Takayoshi Shihomura, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 160,077, Jun. 16, 1980, abandoned.
This application May 26, 1982, Ser. No. 382,205
Claims priority, application Japan, Jun. 28, 1979, 54-80808
Int. Cl.³ C21D *9/573*
U.S. Cl. 266—109 8 Claims



1. In an apparatus for carrying out a continuous annealing treatment on a steel strip, a cooling unit for cooling a steel strip which has been heated to a temperature above a recrystallization point in the continuous annealing treatment, comprising:

a cooling chamber (**12**) for receiving said heated steel strip;

a plurality of cooling rollers (**32**, **32***a*) in said cooling chamber and about which said steel strip is adapted to be passed so that said steel strip contacts said cooling rollers over a given contact area so as to be cooled thereby; and

elevating means (**30**) for selectively raising and lowering some of said plurality of cooling rollers with respect to remaining cooling rollers for selectively changing a contact angle and the contact area between said steel strip and said cooling rollers and for selectively releasing the

contact between said steel strip and said cooling rollers, to thereby vary the cooling rate of said steel strip;

said cooling chamber further comprising means for water-quenching said steel strip when the contact between said steel strip and said rollers is released.

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**4,422,624**

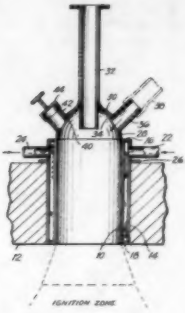
## CONCENTRATE BURNER

**H. E. Dunham; David Arana, both of Morenci, Ariz.; Terrell D. Jackson, Littleton, Colo.; Brent E. McEuen, Safford, and John A. Schneider, Morenci, both of Ariz., assignors to Phelps Dodge Corporation, New York, N.Y.**

**Filed Aug. 27, 1981, Ser. No. 296,874**

**Int. Cl.³ F27D *3/10*; F23D *11/36***

**U.S. Cl. 266—182** **10 Claims**




1. A sulfide concentrate burner particularly adapted for use in the flash smelting of sulfide concentrates in a reverberatory furnace comprising a cylindrical mixing chamber, a convexo-concave housing affixed to one end of said mixing chamber, an oxidizing gas feed pipe extending through said convexo-concave housing and into the central part of the concave portion thereof and aligned with the central axis of said mixing chamber, and at least one concentrate feed port located in said convexo-concave housing, said oxidizing gas feed pipe adapted to eject a jet of oxidizing gas into said mixing chamber and create a subatmospheric pressure within said convexo-concave housing whereby sulfide concentrate is aspirated from said concentrate feed port and mixed with said jet of oxidizing gas to produce at the end of said mixing chamber opposite said convexo-concave housing a jet comprising a mixture of oxidizing gas and sulfide concentrate.

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**4,422,625**

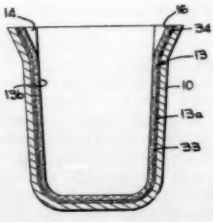
## FOUNDRY POURING LADLE PROTECTIVE LINER

**Carrol R. Thurn, Minnetonka, Minn., assignor to FMC Corporation, Chicago, Ill.**

**Filed Feb. 23, 1982, Ser. No. 351,557**

**Int. Cl.³ C21B *3/00***

**U.S. Cl. 266—281** **15 Claims**




1. A ladle assembly for receiving and transferring non-ferrous metal in a liquid state between a melting furnace and a mold, comprising

a rigid external pouring ladle fabricated of a material having a melting point above the liquid metal temperature,

a ladle liner of a material which burns at a temperature above the liquid metal temperature, said liner having an external surface generally similar in shape to and spaced from the internal surface of said external ladle,

a particulate support mass disposed between said external and internal surfaces of said ladle liner and external ladle respectively, and

a refractory cap overlying that portion of said particulate support mass which is exposed between the upper edges of said external ladle and said ladle liner.

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**4,422,626**

## APPARATUS FOR REPAIRING A REFRACTORY FURNACE LINING

**Friedrich Baumgartner; Alfred Romar, and Albert Rigles, all of Veitsch, Austria, assignors to Veitscher Magnesitwerke-Actien-Gesellschaft, Vienna, Austria**

**Filed Nov. 1, 1982, Ser. No. 437,910**

**Claims priority, application Austria, Nov. 13, 1981, 4918/81**

**Int. Cl.³ F27D *1/16***

**U.S. Cl. 266—281** **10 Claims**

1. In an apparatus for building up and repairing a portion of a refractory lining of an industrial furnace or hot-running vessel, which comprises

(a) a vertically extending rotary shaft,

(b) a horizontally extending centrifuging disc keyed to the shaft for rotation therewith, the disc being capable of being lowered into the furnace or vessel,

(c) an inlet funnel surrounding the shaft above the disc for supplying a particulate refractory material thereto whereby the disc may be lowered into the furnace or vessel and rotated for centrifugally throwing the supplied refractory material against the portion of the refractory lining to be built up and repaired,

(d) a conical element keyed to the shaft for rotation therewith and defining a conically outwardly tapering inlet conduit of annular cross section having an upper end in communication with the inlet funnel and a lower end above the disk, the inlet conduit having an inner wall and an outer wall, the combination of

(e) a bell-shaped shutoff valve body surrounding the shaft and vertically adjustably mounted in the inlet funnel for regulating the communication between the inlet funnel and the upper inlet conduit end,

(f) adjustable slide means at the lower inlet conduit end for regulating the flow of the material from the inlet conduit to the disc,

(g) means for spraying water into the inlet conduit, the water spraying means including

(1) a horizontal row of bolts extending from the outer wall into the inlet conduit and distributed over the periphery

thereof, at least one of the bolts being hollow and having bores, and

(2) a source of water connected to each hollow bolt for spraying the water through the bores,

(h) wiper elements projecting into the inlet conduit from the inner and outer walls, and

(i) means for delivering a gas under pressure into the inlet funnel in the range of the shutoff valve body, the means including

(1) a circular chamber,

(2) a porous cover over the circular chamber and

(3) a source of gas under pressure connected to the circular chamber whereby the gas under pressure enters the inlet funnel in finely distributed form.

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**4,422,627**

## ENDLESS SPRING, SUCH AS RINGSPRING

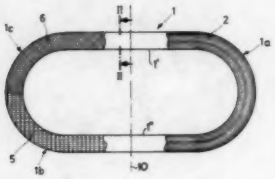
**Helmut Schmidt, Munich; Ulrich Ramm, Neubiberg, and Alexander Schroeder, Ottobrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany**

**Filed Jun. 1, 1981, Ser. No. 268,726**

**Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022418**

**Int. Cl.³ F16F *1/36, 7/00*; B32B *9/04***

**U.S. Cl. 267—148** **13 Claims**



**1.** An endless spring comprising substantially straight leg portions connected by curved end portions, said endless spring forming a frame having a frame plane for taking up loads extending in said frame plane in a main load application direction, comprising a spring body having a plurality of layers (2, 3, 4) made of fiber compound materials and extending in parallel to said frame plane, said layers comprising a first layer type (2) in which fiber bundles are wound so that all the fibers extend unidirectionally in said first layer type and a second layer type (3, 4), each said second layer type comprising at least two plies (5, 6) in which the fibers extend in cross-over relationship relative to each other, said first layer type and said second layer type being arranged in alternate succession relative to each other.

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**4,422,628**

## CLAMPING APPARATUS

**Shigeo Kasai, Sagamihara, Japan, assignor to Amada Company, Limited, Japan**

**Filed Sep. 24, 1981, Ser. No. 305,336**

**Claims priority, application Japan, Sep. 24, 1980, 55-131485**

**Int. Cl.³ B23Q *1/04***

**U.S. Cl. 269—71** **2 Claims**

**1.** A workpiece claiming apparatus (3) for machine tools comprising:

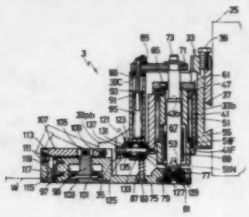
a. a frame (33);

b. a rocking sleeve member (41), rockably fixed to the frame (33);

c. a cylindrical member (51), slidably inserted in the rocking sleeve member (41), so as to move therein;

d. a rod member (67), inserted in the cylindrical member(51), so as to project therefrom;

e. a swinging holding member (75), rockably provided at one end of the rod member (67); and



f. an upper clamping jaw means (111) and a lower clamping jaw means (115), both connected to the swinging holding member (75), for gripping an end of a workpiece (W).

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**4,422,629**

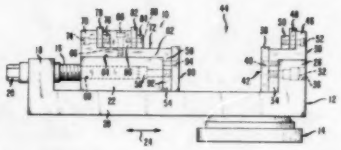
## RANGE JAWS FOR MILLING MACHINE VISES

**Alfred J. Carlson, 9926 W. 143rd Pl., Orland Park, Ill. 60462**

**Filed May 24, 1982, Ser. No. 381,192**

**Int. Cl.³ B25B *1/24***

**U.S. Cl. 269—282** **9 Claims**



**1.** In the combination of a vise, the vise having a stationary end member, the moveable end member having a flat elongated upper surface, said flat elongated upper surface being substantially normal to a work piece clamping surface located on the moveable end member, said vice including a stationary flat surface extending between said stationary member and said moveable end member, the improvement comprising a first accessory member, a second accessory member, a third accessory member, the first accessory member having a Z-shaped cross-section, said Z-shaped cross-section of said first accessory member including removeable joining means for joining said first Z-shaped cross-section accessory member to said moveable end member, said second accessory member having a second Z-shaped cross-section, said second Z-shaped cross-section of said second accessory member including means to removeably join said second accessory member to said stationary end member, said first accessory member including a first leg portion and a second leg portion and a portion intermediate said first leg portion and said second leg portion, said second leg of said first accessory member having a free end, said free end of said second leg of said first accessory member being disposed in sliding touching engagement with said stationary flat surface, said second accessory member including a first leg portion and a second leg portion and a portion of said second accessory member intermediate said first leg portion and said second leg portion, said second leg portion of said second accessory member having a free end, said free end of said second leg portion of said second accessory member residing in touching engagement with said flat surface, said intermediate portion of said first accessory member including a pair of lateral surfaces, said pair of lateral surfaces being disposed in spaced apart parallel relationship, said pair of lateral surfaces extending intermediate said first leg portion and said second leg portion of said first accessory member, said third accessory member including means for removeably securing said third

accessory member to said first accessory member, said third accessory member being provided having an outermost surface configured to rest upon one of said pair of lateral surfaces, said intermediate portion of said first accessory member having the other of said pair of lateral surfaces configured to reside upon said flat elongated upper surface of said moveable end member, said second accessory member having a supporting surface configured to reside upon a lateral surface of said stationary end member, a first supporting block, a first clamping plate member, means to removeably secure said first clamping block and said first clamping plate to said first leg of said first accessory member, a second supporting block a second clamping plate, means to removeably secure said second supporting block and second clamping plate to a leg of said second accessory member, a third supporting block, a third clamping plate, a third clamping member, means to removeably secure said third supporting block and said third clamping plate to a surface of said third clamping member, a surface of said first supporting block and a surface of said first clamping plate being disposed at right angles to one another, a surface of said second supporting block and a surface of said second clamping plate being disposed at right angles to one another, a surface of said third supporting block and a surface of said third supporting clamping plate being disposed at right angles to one another, wherein said supporting surface of said first accessory member defines a plane, said surface of said first supporting block and said surface of said second supporting block and said surface of said third supporting block being disposed equidistant from said plane, wherein said third accessory member comprises one end and another end and at least one lateral surface, thereinbetween, a notch, said notch being located on said one end of said first accessory member, said notch being configured to accommodate said first supporting block residing therewithin when said at least one lateral surface of said third accessory member is disposed clampingly engaged to said supporting surface of said first accessory member.

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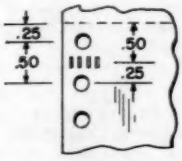
**4,422,630**

## BLADE HOLDER AND METHOD OF USING THE SAME

**John L. Trentman, Tipp City, Ohio, assignor to Harris Corporation, Melbourne, Fla.**

**Filed May 14, 1982, Ser. No. 378,380**
**Int. Cl.³ B42B 2/00**
**U.S. Cl. 270—53** **4 Claims**




1. A crimp blade holder for attachment to a shaft and for removably mounting a plurality of crimp blades, comprising:

a body having first and second cylindrical portions, each of said portions having a periphery defining an outer diameter, said portions being joined together at an end face of each of said portions and disposed along a common axis;

said body having a hole extending axially therethrough, said shaft being insertable through said hole;

said first portion having a plurality of slots arrangement about the periphery thereof in a first spaced relationship for removably inserting one of said crimp blades into each of said slots;

said second portion having a plurality of slots arranged about the periphery thereof in a second spaced relationship for removably inserting one of said crimp blades into each of said slots;

means for securing said crimp blades within each of said slots; and

means for securing said body to said shaft at a selected one of a plurality of positions therealong;

the outer diameter of said first cylindrical portion being greater than the outer diameter of said second cylindrical portion.

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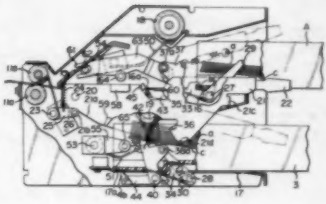
**4,422,631**

## PAPER FEEDING DEVICE FOR RECORDING APPARATUS

**Tsugio Sugizaki, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

**Filed May 20, 1981, Ser. No. 265,362**
**Claims priority, application Japan, May 28, 1980, 55-71012**
**Int. Cl.³ B65H 5/26**
**U.S. Cl. 271—9** **1 Claim**



1. A paper feeding device for recording apparatus comprising, a plurality of paper feeding racks for loading detachable cassettes loaded with paper, a paper feed roller for each rack a manual lever capable of taking a plurality of positions, each corresponding to one of said paper feeding racks and a neutral position, means urging the return of said lever from each of said plurality of positions back to said neutral position, a stopper for each rack prohibiting the loading of a cassette onto a corresponding paper feeding rack and removal of any already loaded cassette from said paper feeding rack whenever said manual lever is set to a position corresponding to said rack, a locking member for locking said manual lever when said manual lever is moved to one of said positions, a sensor for unlocking said locking member and for permitting return of said manual lever to said neutral position whenever a paper feeding rack is completely loaded with a cassette, and further means for permitting insertion of a cassette when said manual lever is set to one of said positions, and for urging the paper into contact with said paper feeder roller when said manual lever is returned back to its neutral position.

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**4,422,632**

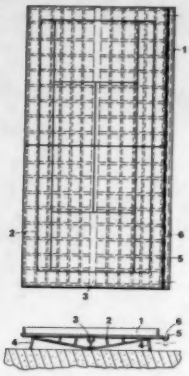
## TILTABLE TENNIS COURT

**Pierre Trottet, Le Coulet 1165, Allamand, Switzerland**

**Filed May 26, 1982, Ser. No. 382,240**
**Claims priority, application Switzerland, Jun. 4, 1981, 3668/81**
**Int. Cl.³ A63J 3/00**
**U.S. Cl. 272—3** **3 Claims**

1. A tennis court characterized in that it comprises a panel and a pivot on which said panel is mounted, said pivot oriented

along the longitudinal axis of said panel, a frame supporting said panel and engaging said pivot, and jacks at opposite sides



of said frame to adjust the lateral inclination of the panel- has been inserted.

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**4,422,633**

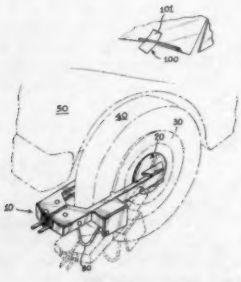
**SIMULATED WHEEL IMMOBILIZING APPARATUS**

**John J. Petrone, 110 Roberts La., Apt. 100, Alexandria, Va. 22314**

**Continuation-in-part of Ser. No. 129,552, Mar. 12, 1980, abandoned. This application Aug. 6, 1981, Ser. No. 290,441**

**Int. Cl.³ A63J** *5/02*

**U.S. Cl. 272—8 N** **6 Claims**



1. A novelty/advertising device for use in combination with the windshield and one wheel of a vehicle, wherein the device comprises:

a first flexible major component dimensioned to be disposed around, but spaced from, at least a portion of the said one wheel, and further having an exterior configuration which closely resembles a wheel immobilizing device, wherein the first major component comprises an enlarged portion dimensioned to overlie a portion of the hub of the said one wheel, and an elongated L-shaped arm projecting from the enlarged portion and extending beyond the radius and at least a portion of the width of the vehicle wheel, and at least one downwardly depending support element disposed on the first major component, and dimensioned to support the said enlarged portion adjacent to, but spaced from, the hub whereby the first major component may be positioned adjacent to, but spaced from one wheel of a vehicle, to give the impression that a wheel immobilizing device has been physically attached to said one wheel, and

a second flexible major component adapted to be placed on the windshield of a vehicle, wherein the second major component is dimensioned and colored so as to resemble a traffic ticket commonly issued in a given geographical area, and has promotional material imprinted thereon, in lieu of the language found on a traffic summons.

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**4,422,634**

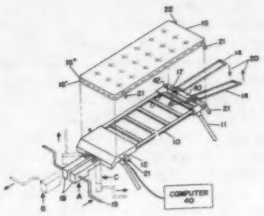
**SWIMMING SIMULATOR**

**Harry C. Hopkins, 15 Lafayette St., White Plains, N.Y. 10606**

**Filed Jun. 8, 1981, Ser. No. 271,390**

**Int. Cl.³ A63B** *69/10*

**U.S. Cl. 272—71** **9 Claims**



1. A swimming simulator for providing a user with the exercise typically produced by swimming, comprising:

support frame having a longitudinal axis resting on a foundation and supporting the torso of the user in a horizontal position at a distance above the foundation;

a pair of arm levers with a longitudinal axis and being extendable from a front part of said support frame, said arm levers including a pair of grip handles adapted to be seized by the user's hands and extending transversely from the longitudinal axis of said arm levers, said grip handles being movable along a circular path against a first predetermined resistance;

a pair of leg levers extending from a rear part of said support frame in a position to contact the legs of the user, the end of each of said leg levers being movable in an arc about a rear pivot point at the other end, such movement being against a second predetermined resistance; and

at least one air pump means connected by a mechanical coupling to at least one of said pair of grip handles and said pair of leg levers for operating said air pump means and providing at least one of said first and second predetermined resistances.

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**4,422,635**

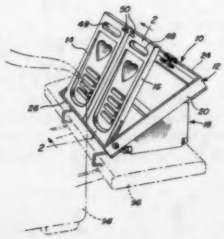
**PORTABLE MULTIPLE USE EXERCISER**

**James V. Herod, P.O. Box 1317, Collegedale, Tenn. 37315, and Charles H. Neal, 2027 Jenkins Rd., Chattanooga, Tenn. 37421**

**Filed Jan. 27, 1982, Ser. No. 344,203**

**Int. Cl.³ A63B** *23/04;* **A61G** *7/04*

**U.S. Cl. 272—96** **8 Claims**



1. A portable multiple use exerciser including a base, a pair

of side-by-side levers pivotally supported at one pair of corresponding ends from said base for independent spring biased oscillation relative to said base between first positions generally paralleling said base and second positions angled relative to said base with the other ends of said levers inclined away from said base, said levers being adapted to be engaged by the feet, hands, knees or elbows of the user, a stand for said base, said base including opposite side marginal portions generally paralleling said levers when the latter are in the first positions thereof, said stand including a support panel having opposite side marginal portions, a pair of wings pivotally supported from said opposite side marginal portions of said panel for swinging movement relative thereto about an axis generally paralleling said side marginal portions and between collapsed positions generally paralleling and overlying one side of said panel and extended limit positions with said wings disposed at generally right angles relative to said panel and projecting outwardly of one side thereof, the free swinging edge portions of said wings being similarly inclined relative to said axes and including first fastening means supported therefrom, the undersurfaces of said opposite side marginal portions of said base including second fastening means supported therefrom with which said first fastening means are releasably engageable for supporting said base in an inclined position relative to a surface upon which said panel rests.

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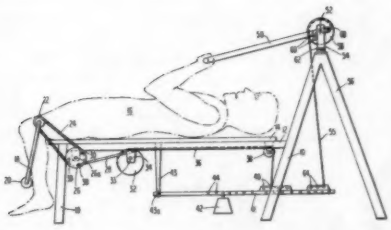
**4,422,636**

## EXERCISE APPARATUS

**Michael M. de Angeli, 12 Raymond Rd., Broomall, Pa. 19008**

**Filed Jun. 18, 1980, Ser. No. 160,614**
**Int. Cl.³ A63B *21/06***
**U.S. Cl. 272—117** **5 Claims**



1. Apparatus for the exercise of body members by the lifting of weight against the force of gravity, comprising:

a frame;

a bench mounted on said frame;

a first rotatable arm, mounted for rotation on said frame at an end of said bench to exercise leg muscles;

a second rotatable arm mounted on said frame for rotation for exercise of arm muscles; and

a weight adapted to be elevated by rotation of either of said first or second arms;

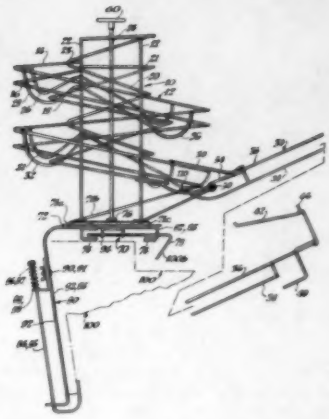
wherein means are provided for operative connection of both said arms to said weight, said means for connection permitting variation of the position of said arms at which rotation thereof causes elevation of said weight to commence, and of the direction of rotation of said arms which elevates said weight, said weight being elevated from a rest position upon rotation of one of said arms, said means for connection permitting variation of said rest position with respect to the position of said arms at which rotation thereof causes elevation of said weight to commence, independent of the position of said arm at which maximum effort is exerted against the force of gravity.

**4,422,637**

## POOL BALL HOLDER AND SPOTTING DEVICE

**Edward A. Bush, 2407 Blossom Ct., Ft. Pierce, Fla. 33450**

**Filed Feb. 8, 1982, Ser. No. 346,550**
**Int. Cl.³ A63D *15/00***
**U.S. Cl. 273—22** **8 Claims**



1. A device for storing and sequentially dispensing billard or pool balls onto the playing surface of a billiard or pool table comprising:

a means for holding and storing the balls in a sequence selected by the player;

a means for removably attaching said holding means onto the edge of the table;

a means for placing one ball at a time onto the playing surface in a position selected by the player, said placing means having a proximal and a distal end;

a means for rotating said placing means in arcuate fashion, said rotation means for increasing the range of available ball placement by the player;

said attaching means interconnected between the lower end of said holding and storing means and said rotating means;

a biasing means for holding said distal end of said placing means above the playing surface when not in use;

said holding and storing means aided by gravity to deliver the balls to said placing means;

said placing means pivotally connected to said holding and storing means at said proximal end of said placing means;

said placing means pivotable about said pivot connection by the player by manual arcuate movement of said distal end of said placing means downwardly to the table surface;

said ball placement determined by the position of said distal end selected by the player.

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**4,422,638**

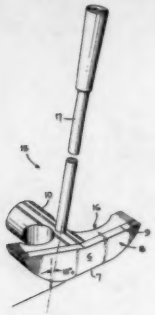
## GOLF PUTTER

**Richard B. C. Tucker, Baltimore, Md., assignor to Wm. T. Burnett & Co., Inc., Baltimore, Md.**

**Filed Jan. 23, 1981, Ser. No. 227,636**
**Int. Cl.³ A63B *53/08***
**U.S. Cl. 273—78** **11 Claims**

1. A putter comprising a shaft and a head having a striking face at one end of said shaft, said head having an elastomer on at least the striking area of said face of said head, said elastomer having a hardness of at least 70 Durometer A and a hardness less than the hardness of a golf ball and a high resiliency with controlled dampening, said hardness permitting penetration of a golf ball into said elastomer when a ball is stroked with said face, and said resiliency and controlled dampening causing said

stroked ball to rebound from said face a distance at least as great as the distance of the rebound of said ball when said ball



is stroked with an equal force with a metal putter head of equal mass.

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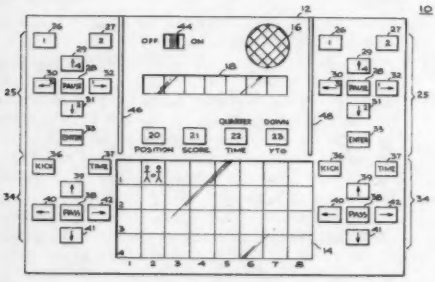
**4,422,639**

## ELECTRONIC FOOTBALL GAME

**Robert M. Del Principe, Hawthorne, and Peter A. Oliphant, Van Nuys, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.**

**Filed Nov. 10, 1980, Ser. No. 205,481**
**Int. Cl.³ A63F *9/00***
**U.S. Cl. 273—94** **12 Claims**



1. An electronic football game comprising:

a display in the form of a playing field having indicia representing a ball, a plurality of offensive players including a quarterback and at least two receivers any one of which may be a ball carrier and each capable of receiving the ball, running with the ball and passing the ball at any time during an individual play of the game, and a plurality of defensive players;

run input means responsive to operator control for maneuvering the ball carrier about the field at any time during an individual play of the game;

pass input means responsive to operator control for passing the ball from the ball carrier at any time during an individual play of the game and from any position on the playing field; and

control means responsive to the run and pass input means for starting an individual play, for executing multiple run maneuvers and multiple pass maneuvers during an individual play of the game in response to the run input means and the pass input means, respectively, and for controlling the display indicia to indicate the positions and movement of the players and the ball, and including line means for determining a line of scrimmage on the field, means for determining the position of the ball carrier on the field, means for enabling the ball carrier to execute a forward pass, means for enabling the ball carrier to execute a lateral or backward transfer of the ball, and means for preventing the ball carrier from executing a forward pass if the ball carrier has crossed the line of scrimmage.

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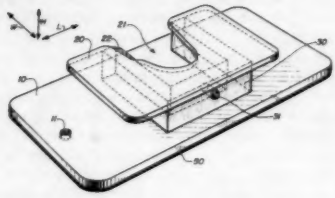
**4,422,640**

## VIDEO GAME CONTROL UNIT AND LAP BOARD HOLDER THEREFOR

**Michael J. Tamarkin, 1610 S. Queen St., York, Pa. 17403**

**Filed Jul. 6, 1982, Ser. No. 395,138**
**Int. Cl.³ A63B *71/04***
**U.S. Cl. 273—148 R** **6 Claims**



1. A lap board holder for supporting a video game control unit of the type wherein a control rod extends generally perpendicularly from the top surface of a generally box-shaped housing which is up to about 6 inches long, up to about 6 inches wide and up to about 3 inches high, comprising:

a rigid planar base having length at least sufficient to span and rest on the legs of a person operating the control unit while seated and width at least equal to the width of the housing;

a rigid planar shelf having length exceeding the length of the control unit by an amount sufficient to provide support for at least one hand of a person operating the control unit and width at least equal to the width of the housing, the periphery of the shelf including a recess; and

means joining the shelf to the base and positioning the shelf above the base in parallel spaced apart relationship such that the housing can be slid into position between the shelf and base and be held there by a tight fit with the control rod positioned in the recess in the shelf.

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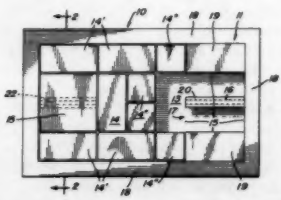
**4,422,641**

## SHIFTABLE BLOCK PUZZLE

**Pierre K. Collin, 1077 B St-Joseph Blvd., Charlesbourg West, Quebec, Canada G2K 1G3**

**Filed Mar. 18, 1982, Ser. No. 359,430**
**Int. Cl.³ A63F *9/08***
**U.S. Cl. 273—153 S** **11 Claims**



1. A shiftable block puzzle comprising a board defining a bottom wall having a flat top surface, a plurality of blocks of different sizes confined for lateral movement on said flat surface, and a restricted area on said flat top surface for reception thereon of a single primary one of said blocks after shifting movements of secondary ones of said blocks to make way for displacement of said primary block from a predetermined starting position, said primary block having means to permit

same to be displaced onto said restricted area, said restricted area provided with a protruding element extending above said flat bottom wall and located to prevent said secondary blocks to enter said restricted area, said means to permit said primary block to be displaced into said restricted area being a slot in a lower surface thereof for reception therein of said protruding element to permit said primary block to be shifted into said restricted area.

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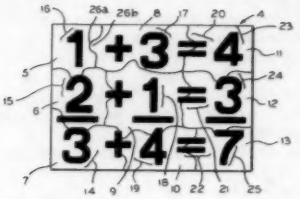
**4,422,642**

## NOVELTY EDUCATIONAL PUZZLE APPARATUS

**Leslie S. Fletcher, 4230 Yorkshire La., Northbrook, Ill. 60062**

**Filed Sep. 30, 1982, Ser. No. 429,327**
**Int. Cl.³ A63F *9/10*; G09B *1/36, 1/38***
**U.S. Cl. 273—157 R** **9 Claims**




1. A novelty educational puzzle for instructing users in multidirectional, mathematical, grammatical and color skills, said apparatus comprising:

a plurality of interlocking yet detachable puzzle piece means;

indicia means comprising written information situated upon said plurality of interlocking puzzle piece means;

said puzzle pieces being capable of interlocking with others of said plurality of puzzle pieces in both horizontal and vertical columns respectively;

assembly restriction means operably associated with said puzzle piece means so as to allow assembly of said puzzle piece means in both the vertical and horizontal directions only when said indicia means is in proper sequence;

said indicia means providing information in both the vertical and horizontal directions;

said indicia means information comprising initial information, and resultant information proximate to two edges of said puzzle; and

said indicia means, said interlocking puzzle piece means, and said assembly restriction means cooperating to provide a puzzle that is restrictive in formation to ensure correct assembly as to both intermediate information and end information in both the vertical and horizontal directions.

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**4,422,643**

## GOLF SWING TRAINING DEVICE

**Emmet J. Cushing, 6115 Dupont Ave. South, Minneapolis, Minn. 55419**

**Filed May 3, 1982, Ser. No. 374,435**
**Int. Cl.³ A63B *69/36***
**U.S. Cl. 273—183 B** **7 Claims**

1. A golf swing training device comprising:

(a) a first section made of rigid material arched over the user's shoulder on each side of the neck and extending to rest against the user's back in substantially stable fashion below the shoulder level;

(b) another section of rigid material continuing from the first section downward from the shoulder along the front of the user resting in substantially stable fashion at about the user's breastbone; and

(c) a straight rigid elongated member attached to and spaced forward from said another section angled in an upward direction, in a forward direction and in a side direction.

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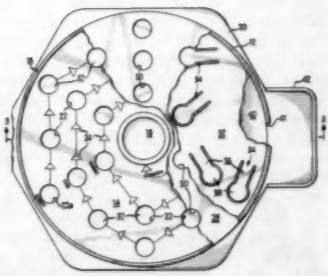
**4,422,644**

## BOARD GAME APPARATUS

**Edward T. Holahan, Chicago, and Harry Disko, South Barrington, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.**

**Filed Nov. 5, 1981, Ser. No. 318,336**
**Int. Cl.³ A63F *3/00***
**U.S. Cl. 273—249** **14 Claims**



13. A board game apparatus, comprising:

a housing;

a playing surface defined on said housing, including a plurality of playing piece receiving apertures;

at least two playing pieces sized to pass through said apertures;

a playing piece support surface on said housing beneath said playing surface arranged to support said playing pieces in said apertures, said playing piece support surface being movable with respect to said playing surface;

a plurality of deflectable elements arranged on said support surface and aligned beneath less than all of said apertures to allow a playing piece to be pushed through said support surface into the interior of said housing; and

means for concealing the location of said deflectable elements when said playing surface is moved.

4,422,645

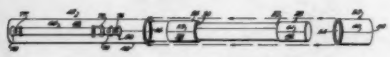
## GAMEBOARD AND CARRYING CASE

Charles R. Simons, 307 Kensington, Ferndale, Mich. 48220

Continuation of Ser. No. 236,720, Feb. 23, 1981, Pat. No. 4,381,113, which is a continuation of Ser. No. 952,311, Oct. 18, 1978, Pat. No. 4,252,324, which is a continuation-in-part of Ser. No. 748,820, Dec. 9, 1976, abandoned, and Ser. No. 674,986, Apr. 8, 1976, abandoned. This application Oct. 5, 1981, Ser. No. 308,860

The portion of the term of this patent subsequent to Feb. 24, 1998, has been disclaimed.

Int. Cl.[3] A63F *3/00*

U.S. Cl. 273—286 5 Claims

1. In combination, a carrying case, a gameboard, a pair of die tossing cups, play pieces and a game pack for storing the play pieces,

said gameboard comprising a sheet of pliable material of uniform thickness having a first and a second pair of opposed right-angularly arranged margin edges spaced from one another a first and a second predetermined distance respectively, and each edge being of said uniform thickness, said gameboard being rolled into a roll and defining a bore of generally circular cross section throughout its length, said length being of a length equal to said first predetermined distance;

said pair of die tossing cups comprising a first and second end cap, said first end cap and said second end cap each having an open end and including a closed circular end wall and a cylindrical axially extending side wall of circular cross section of a predetermined inner diameter substantially equal to the diameter of said gameboard when rolled and each of said end caps including said side walls and end walls being of a common predetermined outer diameter, and each of said end caps being positioned on the ends of said rolled gameboard with the end wall of each cap being in abutting engagement with one of the margins of said gameboard along said second pair of opposed edges and captivated within said end caps and within said axially extending side walls of said end caps, each of said end caps being of an axial length substantially less than one-half the distance between said second pair of opposed edges; and

said carrying case comprising a longitudinally-extending tubular container of circular cross-section of an inner diameter substantially equal to but slightly greater than the outer diameter of the cylindrical side walls and end walls of the end caps, said case having a closed end and an open end, and said gameboard and end caps being in said container, said container snugly jacketing said gameboard and end caps, said container being of an axial length substantially equal to but slightly greater than the first predetermined length of said gameboard and the thickness of the end walls of said first and second end caps and said container having an outer uniform diameter;

cap means for said open end of said tubular container, said cap means comprising a cup-shaped member of a diameter substantially equal to said outer diameter of said container and having an axially extending skirt sized to and snugly jacketing said container adjacent said open end and closing said open end of said container; and

said game pack comprising a pair of bags, each bag having an open end, a closed bottom and side walls of a maximum opening less than the interior of the rolled gameboard and received in the space within the rolled gameboard.

4,422,646

## INFRARED TARGET FOR MILITARY APPLICATIONS AND ITS USE

Stephen P. Rosa, Bethesda, Md., assignor to TVI Energy Corporation, Beltsville, Md.

Filed Sep. 18, 1981, Ser. No. 302,878

Int. Cl.[3] F41J *9/12*

U.S. Cl. 273—348.1 14 Claims

12. An electrically operated military target module capable of emitting an infrared signal when an electric current from an electrical power source having two poles is passed therethrough comprising a unitary, composite laminate including:

(A) electrically insulating top and bottom layers, each layer having inner and outer surfaces;

(B) a substantially continuous, electrically conductive layer of substantially uniform thickness between said inner surfaces, wherein said electrically conductive layer is comprised of carbon;

(C) at least two substantially parallel metallic busbars in contact with said electrically conductive layer, each of said busbars having two ends;

(D) a first electrical connector means for connecting both ends of one of said busbars to one pole of an electrical power source;

(E) a second electrical connector means for connecting both ends of another of said busbars to the other pole of the electrical power source;

wherein said top layer and said bottom layer have edges, which are sealed together to thereby form an enclosed laminate containing the electrically conductive layer; and said outer surface of said top layer is covered by a thermal insulating pad containing a multiplicity of discrete air-containing cells through which said infrared signal can pass.

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4,422,647

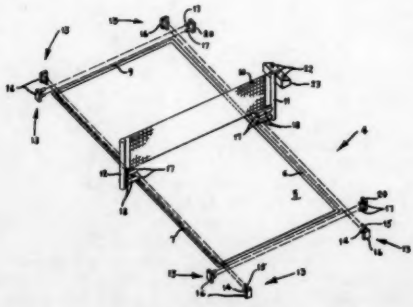
## VOLLEYBALL OUT OF BOUNDS DETECTING AND INDICATING SYSTEM

Wayne D. Wilson, 4934 Turquoise Cir., Colorado Springs, Colo. 80917, and James J. Joyce, 7630 Topin Rd., Colorado Springs, Colo. 80908

Filed Feb. 19, 1982, Ser. No. 350,529

Int. Cl.[3] A63B *71/06*

U.S. Cl. 273—411 8 Claims



1. In combination with a volleyball court having a net and sideline and endline bounds defining a playing surface, a vol-

leyball out of bounds detecting and indicating system comprising

light beam generating means projecting light in the form of upper and lower juxtaposed light beams around the outer periphery of said playing surface said light beams being spaced apart a distance that prevents simultaneous interruption of both beams by a single volleyball, said light beams being positioned outside of and proximately spaced from said sideline and endline bounds with said lower beam being proximately spaced from said playing surface,

detector means receiving said projected light and outputting signals in response thereto, and

volleyball out of bounds indicating means receiving said detector means output signals and generating out of bounds indication signals exclusively in response to volleyball incurred light beam interruptions.

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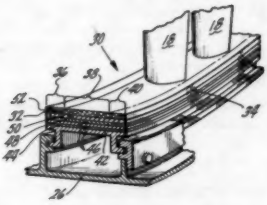
4,422,648

## CERAMIC FACED OUTER AIR SEAL FOR GAS TURBINE ENGINES

Harry E. Eaton, Woodstock, and Richard C. Novak, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 17, 1982, Ser. No. 389,304
Int. Cl.³ F01D 11/08
U.S. Cl. 277—53 4 Claims



1. In an outer air seal of the type circumscribing the turbine rotor blades of a gas turbine engine and having a leading edge region forward of the blades, a midregion opposing the blades and a trailing edge region rearward of the blades, the improvement comprising:

an abradable ceramic coating having higher surface density at the leading edge region of the seal than at the midregion of the seal.

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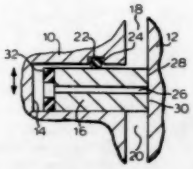
4,422,649

## STIRLING ENGINE PISTON RING

Roy B. Howarth, Clifton Park, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Mar. 2, 1982, Ser. No. 354,020
Int. Cl.³ F16J 9/00
U.S. Cl. 277—75 6 Claims



1. In combination a piston, cylinder and sealing ring for use in providing a seal between the piston and the cylinder in which is contained a high pressure region on one side of the ring and a low pressure region on the opposite side, said ring comprising:

an inner and outer surface, said outer surface having at least two sides, one of which is exposed to high pressure, the other side of which is exposed to low pressure;

a contact surface on said outer surface engageable with the cylinder;

means isolating said inner surface from the high pressure;

a leakage path between the high and low pressure coupled to means capable of communicating a mean pressure to the inner surface of the ring so as to balance pressure forces acting on the inner and outer surfaces; and

means biasing said contact surface into engagement with the cylinder to provide a seal therebetween.

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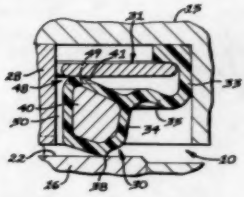
4,422,650

## FLEXIBLE SEAL ASSEMBLY

Harold L. Reinsma, Dunlap; Michael A. Roussin, and Albert L. Woody, both of Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 22, 1982, Ser. No. 421,172
Int. Cl.³ F16J 15/34
U.S. Cl. 277—88 21 Claims



1. In a face seal assembly (10) for a joint (12) having a first member (15) pivotable about an axis (20) relative to a second member (16), the first member (15) having an annular recess (23) disposed about said axis (20) and the second member (16) having a sealing surface (22) confronting said recess (23), said seal assembly (10) being disposed in said recess (23) and including an annular seal (30) of flexible, wear resistant material and a metallic load spring (31), said seal (30) having an axially movable sealing portion (34) with an annular seal lip (38), and said spring (31) being disposed behind said sealing portion (34) and exerting a force for urging and maintaining said seal lip (38) in sealing engagement against said sealing surface (22), the improvement comprising:

a rigid stiffener ring (40) molded into said sealing portion (34) of said seal (30), said stiffener ring (40) being of a construction and position within said sealing portion (34) sufficient for providing the sealing portion (34) with an intervening wall portion (41) separating the stiffener ring (40) from direct force transmitting contact with and from rubbing against the load spring (31) in response to axial movement of said sealing portion (34).

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4,422,651

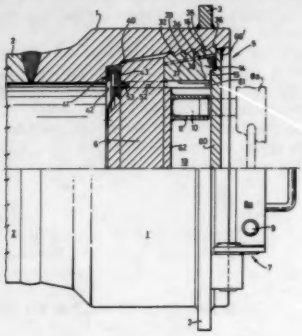
## CLOSURE FOR PIPES OR PRESSURE VESSELS AND A SEAL THEREFOR

Douglas J. Platts, Worksop, England, assignor to General Descaling Company Limited, Nottinghamshire, England

Division of Ser. No. 841,894, Oct. 13, 1977, Pat. No. 4,140,240.
This application Dec. 27, 1978, Ser. No. 974,036
Claims priority, application United Kingdom, Nov. 1, 1976, 45281/76
Int. Cl.³ F16J 15/34
U.S. Cl. 277—206 R 1 Claim

1. A seal comprising a support of relatively rigid material having first and second flanges having remote surfaces adapted to engage respective opposed faces of elements between which

a seal is to be formed, the first flange having a greater surface area than the second flange and being less flexible than the second flange, said flanges extending in substantially parallel planes and said support defining an inwardly opening channel,



and a lining of relatively flexible material carried by the support and extending beyond the terminal edges of the flanges, portions of said lining extending beyond the terminal edges of said flanges including sealing surfaces coplanar with said remote surfaces of said flanges.

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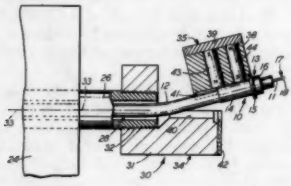
**4,422,652**

## RELEASABLY RETAINING ARTICLES FOR ROTATION THEREOF

**Alan K. Shapiro, Shillington, and Henry R. Siebach, Wyomissing Hills, both of Pa., assignors to Western Electric Co., Inc., New York, N.Y.**

**Filed Apr. 16, 1982, Ser. No. 369,059**
**Int. Cl.³ B23B *31/00*; B23Q *3/152***
**U.S. Cl. 279—1 M** **10 Claims**



1. Apparatus for releasably retaining an article for rotation thereof, comprising:

a chuck body and means for rotating the same about a central axis thereof;

a first jaw associated with the chuck body and disposed generally laterally of the central axis;

a second jaw, complementary with and mountable to the first jaw, at least one of said jaws having seat means aligned generally parallel to said central axis to receive said article such that a generally longitudinal axis of the article is substantially coincident with the central axis of the chuck body; and

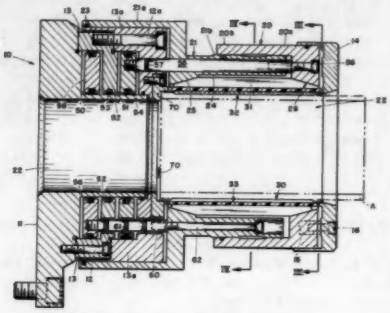
magnetic means, associated with said jaws, for releasably mounting the second jaw to the first jaw, for releasably retaining therebetween an article for rotation about the central axis.

**4,422,653**

## CHUCK FOR TUBULAR WORKPIECES

**Charles Piotrowski, Suttons Bay, Mich., assignor to Sheffer Collet Company, Traverse City, Mich.**

**Filed Apr. 16, 1982, Ser. No. 369,246**
**Int. Cl.³ B23B *31/20***
**U.S. Cl. 279—2 A** **15 Claims**



13. A chuck for gripping tubular workpieces the surface of which may be eccentric, a tubular workpiece clamp having an outer cylindrical sheathe, an inner cylindrical sheathe and a tubular sleeve seated between and firmly engaging both of said sheathes; said sleeve being of a resilient material having memory and capable of radial and circumferential migration; said sheathes each being segmented into elongated strips interconnected at an end of the sheathe whereby said sheathes are capable of diametric expansion and contraction; movable jaw means for alternately compressing and releasing said clamp.

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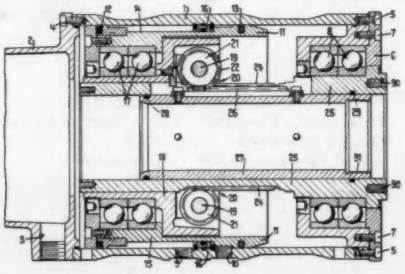
**4,422,654**

## HOLLOW ROTARY CLAMPING APPARATUS

**Kurt Grünig, Lengnau, Switzerland, assignor to Jos. Habegger, AG, Meinisberg, Switzerland**

**Filed Feb. 26, 1981, Ser. No. 238,343**
**Claims priority, application European Pat. Off., Mar. 28, 1980, 80810106.7**
**Int. Cl.³ B23B *31/00***
**U.S. Cl. 279—4** **12 Claims**



1. In a hollow rotary clamping apparatus for use in a lathe, the clamping apparatus including a housing, a piston located coaxially within the housing, the piston having a configuration so as to be displaceable in a longitudinal direction with respect to the apparatus, means for supplying a pressure medium to the piston to displace the piston with respect to the apparatus, a rotary part disposed coaxially within the piston, the rotary part being displaceable with the piston and supported with respect to the piston by bearing means, and an actuating tube to which a collet, chuck or the like is connectable, the actuating tube

being displaceable as a result of movement of the rotary part; in which the improvement comprises:

a racked-bar differential drive mounted on the rotary part, the drive including axles symmetrically arranged on the rotary part, a respective first gearwheel and a respective second gearwheel mounted on each axle, the gearwheels each being rotatable but fixed to the axle on which the gearwheels are mounted so that relative rotation of the first gearwheel with respect to the second gearwheel is prevented, a guide tube located within the rotary part and surrounding said actuating tube, a first racked-bar disposed on the guide tube, the first gearwheel engaging the first racked bar, a slot in the guide tube, and a second racked-bar on the actuating tube, the second gearwheel extending through the slot and engaging the second racked-bar.

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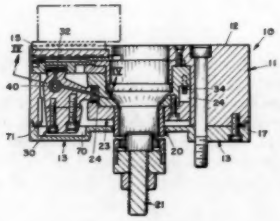
**4,422,655**

## CHUCK WITH IMPROVED JAW ACTUATOR SUPPORT STRUCTURE

**Carlson A. Waite, Bear Lake, Mich., assignor to Sheffer Collet Company, Traverse City, Mich.**

**Filed Aug. 24, 1981, Ser. No. 295,772**
**Int. Cl.³ B23B 5/34; B25G 3/22**
**U.S. Cl. 279—118** **1 Claim**



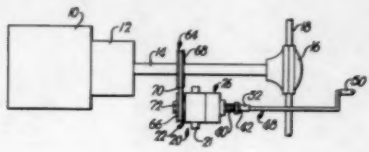
1. In a chuck having a main body member, a plurality of radially extending slots therein opening through the front face thereof, a base for a jaw slidably seated in each of said slots, a plurality of L-shaped levers, each having one leg engaging one of said jaw bases, individual trunnion means mounting each lever; an actuator mounted concentrically of said body member for axial movement and engaging the other leg of each of said levers; each trunnion means having a pair of circumferentially spaced posts with one of said levers being seated between them; a pivot pin extending through each pair of said posts and said lever for supporting the lever for radial rocking movement, a central opening extending lengthwise through said pin and a circumferential channel in said lever surrounding said pin and lubricant conduit means communicating with both said opening and said channel, said chuck characterized in that secondary lubricant conduits extend lengthwise of both legs of each lever and discharge through the ends of each lever engaging said actuator and a jaw base; a lubricant receiving port communicating with one end of said opening in said pin; said main body member having a plurality of pockets, each housing one of said levers and trunnion means; a circumferential channel in the rear of said body adjacent the circumferential periphery thereof communicating with and providing the only interconnection between said pockets adjacent the outer radial periphery thereof whereby lubricant accumulating in said pockets may migrate between the pockets to automatically and uniformly distribute the lubricant between the pockets due to centrifugal forces incident to use of the chuck.

**4,422,656**

## APPARATUS FOR MANUAL ROTATION OF MOTOR VEHICLE DRIVING WHEELS THROUGH PROPELLER SHAFT AND DIFFERENTIAL

**James H. Kaplan, Mission Hills, and Joel S. Lissauer, Overland Park, both of Kans., assignors to Harlan Material Handling Corporation, Kansas City, Kans.**

**Filed May 10, 1982, Ser. No. 376,539**
**Int. Cl.³ B60K 9/00**
**U.S. Cl. 280—3** **9 Claims**



1. Apparatus for facilitating the hitching of a towable vehicle to a towing vehicle behind the latter upon manual rotation of the drive wheels of the towing vehicle through its propeller shaft and differential by a single operator standing on the ground behind the towing vehicle, said apparatus comprising:

a support adapted for connection to the chassis of said vehicle;

an input spindle rotatably carried by said support;

an ouput spindle rotatably carried by said support in axial alignment with the input spindle;

means for transmitting power from said output spindle to said shaft,

the input spindle being shiftable along its axis of rotation relative to the support toward and away from the output spindle;

resilient means yieldably biasing the input spindle away from the output spindle;

means for interconnecting the spindles when the input spindle is shifted toward the output spindle against the action of said resilient means whereby, upon rotation of the input spindle to rotate the output spindle, the shaft is rotated through said power transmitting means; and

a manually operable crank extending rearwardly from said towing vehicle to a point accessible to said operator and having means of connection with the input spindle for rotating the latter,

said interconnecting means being releasable to prevent rotation of the input shaft and crank while the propeller shaft is being rotated during normal operation of the towing vehicle.

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**4,422,657**

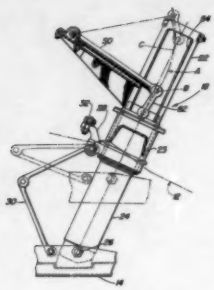
## CONNECTION BETWEEN TELESCOPIC SUSPENSION STRUTS FOR SNOWMOBILE SKIS AND STABILIZER MEMBER

**Larry D. Swanson, Horicon, Wis., assignor to Deere & Company, Moline, Ill.**

**Filed Oct. 6, 1980, Ser. No. 194,550**
**Int. Cl.³ B62B 17/04**
**U.S. Cl. 280—21 R** **2 Claims**

1. In a snowmobile including a longitudinal main frame, right- and left-hand transversely spaced skis suspended from the forward end of the frame respectively by right- and left-hand telescopic struts which each include an outer upright tube fixed to the frame and an inner tube reciprocably and swivelly mounted in the outer tube, a stabilizer member including an intermediate transverse section rotatably mounted on the frame and having right- and left-hand leg sections at its opposite ends respectively connected to the respective inner tubes of the right- and left-hand telescopic struts, an improved connection between each of the inner tubes and the opposite

leg sections, comprising: a stud fixed to the upper end portion of each inner tube and projecting crosswise to the length thereof; said outer tubes being provided with rectangular openings extending lengthwise thereof and respectively having the studs received therein, the openings having respective



widths to provide clearance for permitting the inner tubes to swivel during steering and respective lengths for permitting the inner tubes to move between extended and retracted positions within the outer tubes; and a link connected between each stud and an end of a respective leg.

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**4,422,658**

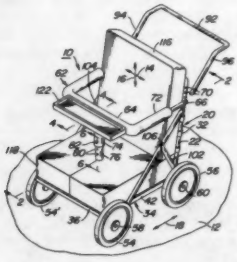
**WHEELED CARRIER**

**Steven F. Hilliard, Odenton, Md., assignor to Roger C. Lam, Columbia, Md., a part interest**

**Filed Sep. 28, 1981, Ser. No. 306,227**

**Int. Cl.³ B62B 9/10**

**U.S. Cl. 280—47.4** **13 Claims**



1. A wheeled carrier comprising:

(a) a substantially planar back frame extending in a substantially vertical plane having a pair of transversely displaced back post members;

(b) a substantially planar base frame coupled to said back frame extending in a substantially horizontal plane;

(c) means for rotating said back frame to a positional location substantially coincident with said horizontal plane formed by said substantially planar base frame, said back frame transversely displaced back post members being pivotally secured to said base frame;

(d) a plurality of wheel members rotatably coupled to said base frame for rolling said wheeled carrier on a base surface; and,

(e) containment means being independently releasably coupled to each of said back and base frames for preventing a user from falling external said wheeled carrier, said containment means being (1) vertically adjustable with respect to said base and back frames, and (2) removable from each of said back and base frames, whereby said containment means maintains said back frame in said substantially vertical plane when said containment means is coupled to said back frame.

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**4,422,659**

**REAR FENDER STRUCTURE FOR MOTORCYCLES**

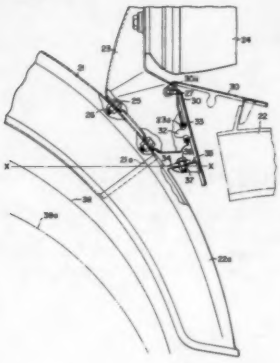
**Hideaki Nebu, Shiki, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 16, 1981, Ser. No. 331,264**

**Claims priority, application Japan, Dec. 29, 1980, 55-185423; Dec. 29, 1980, 55-187958[U]**

**Int. Cl.³ B62B 9/16**

**U.S. Cl. 280—152.1** **6 Claims**



1. A rear fender structure for a motorcycle, comprising

a fender body;

a hinged mount fixed to said fender body and extending rearwardly from said fender body to include a hinge displaced from said fender body and a hinged member;

a fender member fixed to said hinged member, said fender member forming a retractable extension of said fender body.

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**4,422,660**

**REMOVABLE WHEEL ASSEMBLY FOR WHEELCHAIRS**

**William D. Costello, Ventura; Charles J. Helton, III, Camarillo, and Martin B. Frank, Los Angeles, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.**

**Filed Mar. 24, 1982, Ser. No. 361,239**

**Int. Cl.³ B62M 1/14**

**U.S. Cl. 280—242 WC** **32 Claims**

1. An assembly capable of mounting to a wheelchair in duplicate to provide removal of the drive wheels of the wheelchair, the assembly comprising:

(a) a connector block mounted on a wheelchair frame, the connector block having a first orifice extending therethrough for receiving an axle of a drive wheel of the wheelchair and a second orifice extending therethrough and at least partially intersecting the first orifice;

(b) an axle for a drive wheel having an annular groove at one end and extending into the first orifice of the connector block such that the annular groove aligns with the second orifice;

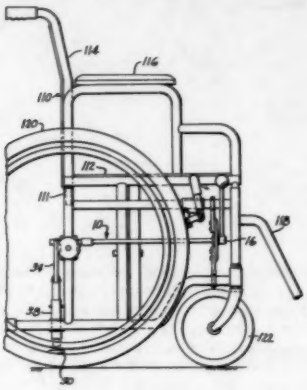
(c) a rod rotatable about its longitudinal axis and extending through the second orifice of the connector block with at least a portion of the rod having a generally circular cross section and a slot therealong, which slot aligns with the first orifice of the connector block;

(d) a first arm fastened to and extending radially from the rod and which moves with rotation of the rod;

(e) a second arm pivotally linked to the first arm;

(f) a leg pivotally linked to the second arm and slidably

mounted to the frame which cooperates with the rod, first arm and second arm to move between a surface-engaging position and surface-disengaging position upon rotation of the rod, such that the rod intersects the annular groove of




the axle when the leg is in the surface-disengaging position and the slot on the rod aligns with the first orifice and faces the annular groove of the axle when the leg is in the surface-engaging position.

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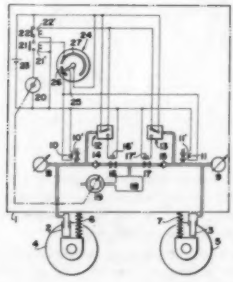
**4,422,661**

**HEIGHT ADJUSTING SYSTEM FOR MOTORCYCLE**

**Sadao Kawamura, Iwata, Japan, assignor to Showa Manufacturing Co., Ltd., Tokyo, Japan**

**Filed Feb. 19, 1981, Ser. No. 235,919**
**Claims priority, application Japan, Apr. 10, 1980, 55-46190**
**Int. Cl.³ B62K *21/02***
**U.S. Cl. 280—276** **6 Claims**




1. In a motorcycle including a front and rear wheel, a front and rear axle, a body supported on said axles, and a speedometer connected to at least one of said wheels, the improvement in providing a height adjusting system for said motorcycle comprising front and rear telescopic suspensions each including a pneumatic shock absorbing mechanism, one of said mechanisms being attached at one end to the rear axle of a motorcycle and the other end being attached to the motorcycle body, and the other of said mechanisms being attached at one end to the front axle of a motorcycle and the other end to the motorcycle body thereby supporting said motorcycle body away from the said axles, a high pressure gas source connected to the said two suspensions and gas flow control means for allowing gas under pressure to flow from the said gas source to the two suspensions when the running speed of the motorcycle is raised, thereby increasing the height of the motorcycle, said gas flow control means including an air pump, a movable contact driven by the speedometer of the motorcycle, a first fixed contact engaged by the movable contact when the motorcycle is either stopped or running at a low speed, and a second fixed contact engaged by the movable contact when the motorcycle runs at a higher speed and operates said air pump supplying the high-pressure gas source.

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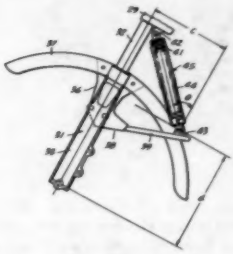
**4,422,662**

**FRONT FORK CONSTRUCTION FOR MOTORCYCLE**

**Hidehiko Inoue, Ooi; Masao Nishikawa, Tokyo, and Nobuo Anno, Urawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 59,286, Jul. 20, 1979, Pat. No. 4,278,266.**
**This application Feb. 18, 1981, Ser. No. 235,555**
**The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.**
**Int. Cl.³ B62K *25/08***
**U.S. Cl. 280—276** **7 Claims**




1. A front wheel suspension assembly for a motorcycle comprising in combination: parallel telescoping forks of the hydraulic type which straddle the front wheel and which are inclined downward in a forward direction, thereby producing a bending moment in said forks with the motorcycle supported in an upright position upon a horizontal surface, each fork comprising an upper tube telescopically mounted within a bottom tube and containing a body of oil, said tubes having continuous cylindrical surfaces in sliding contact and lubricated by said body of oil, a bridge fixed to the upper portions of said upper tubes, means mounting the front wheel for rotation on said bottom tubes, torque receiving means fixed to said bottom tubes, and means including resilient means extending between said bridge and said torque receiving means for applying a counter bending moment to said forks in opposition to the first said bending moment, thereby reducing sliding friction between said telescoping tubes.

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**4,422,663**

**FOLDABLE AND PORTABLE VEHICLE**

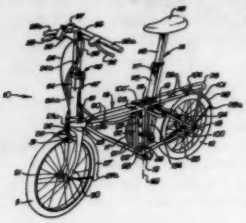
**David T. Hon, Los Angeles, Calif., assignor to Hon Corporation, Los Angeles, Calif.**

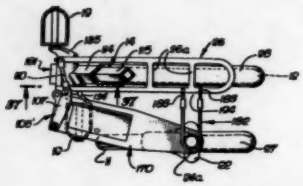
**Division of Ser. No. 233,624, Feb. 12, 1981. This application Sep. 29, 1982, Ser. No. 427,431**
**Int. Cl.³ B62K *15/00***
**U.S. Cl. 280—278** **10 Claims**

1. A foldable and portable bicycle and cart, comprising:
front and rear frame sections disposed in end-to-end relation to form an elongated frame, said front frame section having a front wheel mounted at its front end and said rear frame section having a rear wheel mounted at its rear end;
a foldable handlebar assembly on said front frame section above said front wheel;
a hinge joining said frame sections together for swinging from end-to-end relation into folded side-by-side relation with said sections in a preselected folded position and

holding said wheels in substantially parallel positions when said sections are in said preselected folded positions; and

an auxiliary wheel assembly mounted on said frame adjacent





said hinge and including an auxiliary wheel normally stored in a raised storage position and selectively extendable beneath said frame to approximately the level of said front and rear wheels, thereby to convert said bicycle to a three-wheeled cart.

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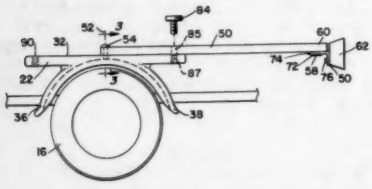
**4,422,664**

**BOAT TRAILER FENDER, LAMP AND LICENSE PLATE SUPPORT**

George A. Poveromo, Miami, Fla., assignor to Sebert E. Reese, II, Miami Lakes, Fla.

Filed Jun. 16, 1981, Ser. No. 273,565
Int. Cl.³ B62D 3/10
U.S. Cl. 280—414.1 8 Claims



1. A fender, lamp and license plate support, for a boat trailer comprising:

a semi-circular portion

a horizontal base having ends

a hollow bar having a lamp and license plate attached thereto;

said semi-circular portion being integral with said horizontal base and depending therefrom; and

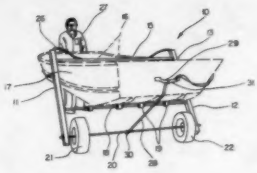
said hollow bar pivotably attached to said base midway of said ends so that the lamp and license plate may be positioned behind the trailer during over-the-road travel and repositioned forward of the trailer during launching of a boat therefrom whereby the lamp will not contact the water during launching.

**4,422,665**

**BOAT TRANSPORTATION AND LAUNCHING MEANS**

William M. Hinnant, Wendell, N.C. 27591

Filed Nov. 2, 1981, Ser. No. 317,285
Int. Cl.³ B60P 3/10
U.S. Cl. 280—414.2 7 Claims



1. A boat type transportation, launching and recovery means for use in conjunction with boat type device having end portions, sides and a bottom comprising: a pair of upright means; means extending between said upright means for supportingly engaging said bottom of said boat type device; means extending between said upright means for engaging the upper edge of said sides of said boat type device; and wheel means rotatively mounted adjacent the lower portion of said upright means whereby an improved boat type transportation, launching and recovery means is provided.

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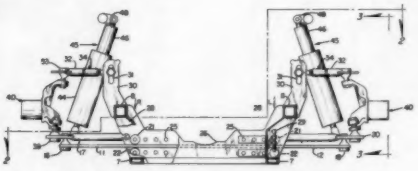
**4,422,666**

**SUSPENSION MECHANISM FOR AUTOMOTIVE VEHICLES**

Rudy R. Proctor, Wheatridge, Colo., assignor to Spring Technology, Ltd.

Filed Aug. 5, 1981, Ser. No. 290,350
Int. Cl.³ B60G 3/00
U.S. Cl. 280—694 16 Claims



1. In a vehicle suspension system wherein a chassis is supported by laterally spaced wheels, there being a pair of wheels located at opposite sides of the front and rear ends of said chassis, the improvement comprising:

at least one laterally extending cantilevered spring member extending from connection to one of said wheel, said spring member connected to traverse the substantial span between a pair of wheels at one of said front and rear ends, and the end of said spring member opposite said connected end bearing against said chassis, a second laterally extending, cantilevered spring member extending from connection to another of said pair of wheels opposite to said connected end of said one spring member, said second spring member dimensioned to traverse the substantial span between said pair of wheels in juxtaposed relation to said one laterally extending cantilevered spring member, said one spring member being bifurcated throughout its greater length to define spaced parallel spring portions, and said second spring member dimensioned to be of a width for extension between said spaced parallel spring portions; and

support means disposed above and bearing against said spring members at intermediate points along the length of

said springs relatively near the connected end of each said spring member and away from the opposite end, said support means being secured to said chassis whereby an unbalanced, downwardly directed force imparted to said support means is operative to generate a downwardly directed bending moment about said connected end which is imparted through the opposite end of each said spring member to said chassis.

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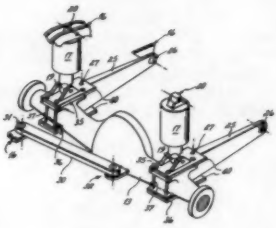
4,422,667

## SUSPENSION FOR A TRACTOR-SCRAPER

Gary D. Perry, Lubbock, Tex., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Dec. 30, 1981, Ser. No. 335,872
Int. Cl.³ B60G 11/26
U.S. Cl. 280—705 4 Claims



1. In a scraper-tractor having an axle housing and a frame, a suspension for supporting said frame with respect to said housing comprising:

a pair of laterally spaced brackets projecting from said housing,

a pair of laterally spaced generally horizontal longitudinally-extending arms,

pins pivotally securing one of the ends of said arms with respect to said housing brackets,

ball joints securing the other ends of said arms to said frame,

a vertical hydraulic spring pivotally mounted between said housing and said frame,

and a generally horizontal transverse track bar pivotally mounted at its ends between said frame and axle housing, respectively.

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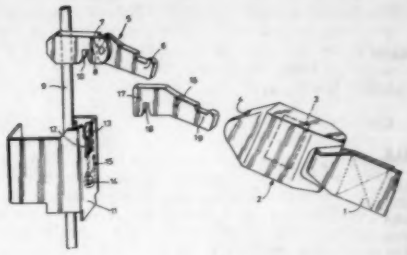
4,422,668

## PASSIVE SAFETY DEVICE

Albert Thill, Weyhausen, and Wolfgang Sukopp, Wolfsburg, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jan. 11, 1982, Ser. No. 338,630
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1981, 3105480
Int. Cl.³ B60R 21/10
U.S. Cl. 280—804 2 Claims

1. A passive safety device for vehicles, for example passenger automobiles, has a safety belt with at least one upper end associated with the shoulder of a vehicle occupant, said upper end being connectable by means of a manually-operable belt lock to a shackle held on a slide which can be displaced by a guide means between a release position and a restraining position, when in the restraining position said slide can be locked in a receiving means fixed on the vehicle body by means of a spring-loaded locking latch, characterized in that there is provided a lock insertion shackle carried separately in the vehicle, one end of said lock insertion shackle being connectable with



the belt lock and its other end being engageable in the receiving means.

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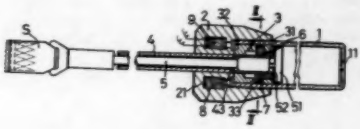
4,422,669

## SEAT BELT TENSIONING DEVICE

Masakazu Chiba, Susono; Satosi Kuwakado, Aichi; Toshihiro Takei, Kariya; Noboru Tsuge, Kariya, and Toshiaki Shimogawa, Aichi, all of Japan, assignors to Nippon Soken, Inc. and Toyota Jidosha Kogyo Kabushiki Kaisha, both of Aichi, Japan

Filed Feb. 2, 1981, Ser. No. 230,711
Claims priority, application Japan, Feb. 4, 1980, 55-13302[U]
Int. Cl.³ B60R 21/10
U.S. Cl. 280—806 7 Claims



1. A seat belt tensioning device for a vehicle comprising:

a cylinder having a piston slidably disposed within said cylinder so as to move in only one direction;

piston operating means for moving said piston in said one direction during an emergency to apply a tensioning force to the seat belt;

a plastically deformable metallic pipe, one end of which is disposed within said piston so as to move in said direction together with said piston;

a metallic rod, one end of which is connected to a seat belt and the other end of which is disposed within said one end of said metallic pipe;

a seat belt tensioning force limiting member secured to the said other end of said metallic rod to connect said rod to said piston; said tensioning force limiting member being broken when the seat belt tensioning force of said piston reaches a predetermined value;

locking means for locking said pipe and said piston in said cylinder when said seat belt tensioning force limiting member is broken;

said pipe being provided with an inner projecting portion which is engaged with said rod when tension load is applied to said seat belt so as to pull said metallic rod in the direction opposite to said one direction after said seat belt tensioning force limiting member is broken and said pipe is locked in said cylinder; and

said projecting portion being plastically deformed by said rod when the tension load applied to said seat belt reaches the plastically deforming load of said pipe.

4,422,670

## COLOR DEVELOPING SHEET FOR PRESSURE-SENSITIVE RECORDING SHEET

Akira Hasegawa; Ippei Shimizu, both of Tokyo; Kaneko Toshio, and Sumio Miyake, both of Iwaki, all of Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1982, Ser. No. 343,840
Claims priority, application Japan, Feb. 12, 1981, 56-18102
Int. Cl.³ B41M 5/16, 5/22
U.S. Cl. 282—27.5 14 Claims

1. Color developing sheet for a pressure sensitive recording sheet having a color developing layer comprising an organic electron acceptive color developing agent, calcium carbonate and styrene-butadiene copolymer latex or carboxylated styrene-butadiene copolymer latex of an average particle size of less than 0.08μ and wherein the ratio of styrene to butadiene in the styrene-butadiene copolymer latex is from 40:60 to 70:30, said calcium carbonate being used in an amount of more than 30% by weight per total solid content of said color developing agent.

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4,422,671

## COATING COMPOSITIONS FOR THE PRODUCTION OF A RECORDING MATERIAL

Manuel Cespon, Vienna, Austria, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 130,304, Mar. 14, 1980, Pat. No. 4,348,234.
This application Jun. 30, 1982, Ser. No. 393,896
Claims priority, application Austria, Mar. 20, 1979, 2073/79
Int. Cl.³ B41L 1/20
U.S. Cl. 282—27.5 6 Claims

1. A color-developing sheet for pressure-sensitive recording material, consisting of at least one substrate sensitized with a color-developing composition, containing a color developer consisting essentially of at least two water-soluble, inorganic, metal salts, including at least one nitrate with a molecular weight of 150 to 350 and at least one halide with a molecular weight of 120 to 280.

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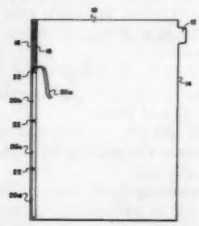
4,422,672

## INDEX SHEET

Kurt L. Levi, 80 Wingold Ave., Toronto, Ontario, Canada

Filed Aug. 31, 1981, Ser. No. 298,173
Int. Cl.³ B42F 21/02; B42D 9/00, 13/00
U.S. Cl. 283—39 5 Claims



1. An index sheet for a bound volume, having pages of predetermined width and height, said index sheet comprising;
- a rectangular panel of flexible sheet material, having a predetermined width corresponding at least to the width of said pages of said volume;
- tab means on said panel on the right-hand edge thereof, and extending outwardly from said edge, and adapted to carry indexing indicia;
- a pressure sensitive adhesive strip on the left-hand edge of said panel, and,
- a plurality of removable cover strips covering said adhesive strip and arranged in end-to-end alignment in a single row whereby when one of said cover strips is removed, a portion of said adhesive strip is exposed, while the remainder of said cover strips remain in position covering the remainder of such adhesive strip in such row and said panel is inserted between the pages of said volume with said adhesive strip adjacent the left-hand edges of said pages, said exposed portion of said adhesive strip secures said panel in position with said tab means extending outwardly from the right-hand edge of said volume, exposing same to view, removal of one of said cover strips leaving the remainder thereof in such row undisturbed whereby said panel may be inserted into one said volume and used and may then be removed therefrom, and by removing a further one of said cover strips, said panel may then be inserted elsewhere.

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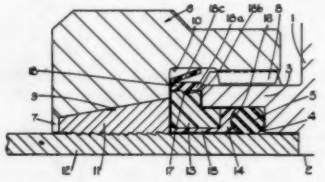
4,422,673

## PIPE COUPLINGS

John E. Blackford; John J. Kelly, both of Coventry, and Philip A. Baker, Solihull, all of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Jun. 3, 1981, Ser. No. 269,408
Claims priority, application United Kingdom, Jun. 4, 1980, 8018262
Int. Cl.³ F16L 55/00
U.S. Cl. 285—23 12 Claims



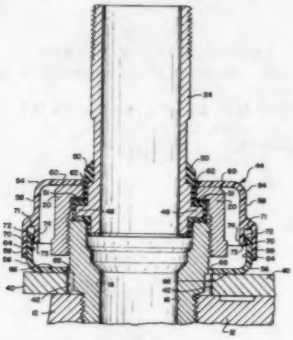
1. A pipe coupling comprising:
- body means including an externally screw-threaded sleeve, for receiving an end of a pipe and for receiving a sealing ring engageable between the body and the pipe;
- a nut having a bore therethrough for receiving the pipe, said nut including threaded means, at one end of said bore, for engaging said externally screw-threaded sleeve, said nut further including a tapered portion at an other end of said bore, said tapered portion tapering inwardly towards said other end of said bore, said nut further including a recess in an intermediate portion of said bore;
- pipe-gripping collet means, disposed in said nut, said collet means including a tapered external surface means for engaging said tapered portion of said bore, said tapered external surface means tapering inwardly towards said other end of said bore, said collet means further including an internal surface means for engaging an external surface of the pipe and gripping the pipe as a result of relative movement between said nut and said collet;
- a back-up member disposable into said intermediate portion of said bore; and
- on at least partly resiliently deformable retainer ring, said retainer ring including means for detachably engaging said back-up member, said retainer ring extending into said recess in said intermediate portion of said bore, whereby said collet means is retained against disengagement from said bore in one direction by mutual engagement of said tapered surfaces and in an opposite direction by engagement of said retainer ring with said nut and with said back-up member.

4,422,674

## TAMPER PROOF GAS METER

Richard L. Steuernagle, DuBois, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 3, 1980, Ser. No. 203,305
Int. Cl.³ F16L 55/00
U.S. Cl. 285—30 9 Claims



1. An enclosure for loosely enclosing a gas meter swivel nut comprised of first and second cylindrical sleeve members of easily destructable material each having cylindrical side walls spaced from said nut and terminating in free ends, the free end of said second sleeve member being telescoped within the free end of said first sleeve member, cooperating locking means respectively within each of said sleeve members preventing disassembly of said sleeve members from each other whereby access to the interior of said enclosure can be achieved only by destruction thereof, said locking means being comprised of a resilient retainer secured within said first sleeve member having an abutment portion on the free edge thereof, abutment means on the interior of said second sleeve member which is engaged by the abutment portion of said retainer when said sleeve members are in assembled relationship thereby preventing diassembly of said sleeve members from one another.

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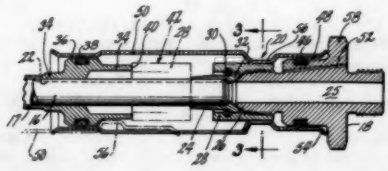
4,422,675

## CO-AXIAL TUBE COUPLING

James R. Norris, Bolton, and Norman W. Narkon, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 29, 1981, Ser. No. 287,680
Int. Cl.³ F16L 11/12
U.S. Cl. 285—45 7 Claims



1. A coupling for connecting tubing to a connector including a connector and a tubing, each having a passageway therethrough, said connector having a generally circular elongated body having said passageway in axial alignment with said passageway in said tubing, said connector having a threaded end, a retractable nut adapted to threadably engage said threaded end, a ferrule member and means sealingly securing said ferrule member to the end of the tubing intended to be joined by said coupling, means on said nut cooperating with said ferrule to secure said ferrule in sealing engagement with said connector, an adapter having a circular cross section axially spaced from said ferrule and means sealingly securing said adapter to said tubing and a first radial seal supported in a recess formed in the outer diameter of said adapter, a second radial seal axially disposed relative to said first radial seal and supported in a recess formed in the outer diameter of said circular elongated body of said connector, the diameter of said first radial seal being substantially equal to the diameter of said second radial seal, a retractable sleeve-like element having a generally hollow cylindrical body being dimensioned to engage each of said radial seals spanning said ferrule when deployed in its operating condition for capturing and containing any leakage from said passageways.

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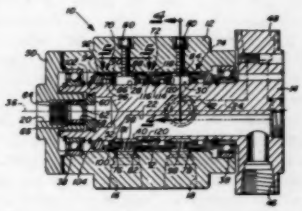
4,422,676

## MULTI-PASSAGE ROTOR COUPLING

Mansur Sitabkhan, North Royalton, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 21, 1980, Ser. No. 209,241
Int. Cl.³ F16L 39/04
U.S. Cl. 285—136 7 Claims



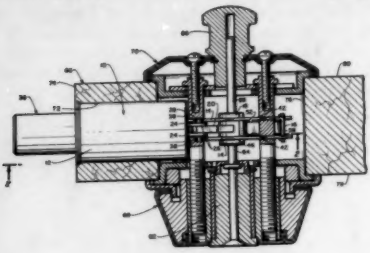
1. A multi-passage rotary coupling comprising a body having an internal cylindrical bore therein, a rotor member having a substantially cylindrical portion located within said cylindrical bore and rotatable relative to said body about an axis of rotation, bearing means interposed between said rotor member and said body located at each end of said bore for supporting said rotor member within said cylindrical bore for rotation relative thereto, three annual wear rings interposed between said bearing means and secured to said cylindrical portion of the rotor member for rotation therewith, one wear ring located adjacent each bearing and a third wear ring spaced axially between said bearings, each wear ring having a sealing face thereon disposed substantially perpendicular to said axis of rotation, a pair of anit-rotation member assemblies, one assembly located between each end wear ring and said central wear ring, said anti-rotation member assemblies each having a pair of axially spaced annular face sealing members, each of said sealing members having a face seal disposed substantially perpendicular to said axis of rotation, one face seal of each sealing member engaging a sealing face of said wear rings, an annular seal on each sealing member engaging the internal surface of said bore, means for preventing said assemblies from rotating relative to said body, said assemblies, wear rings and annular seals forming a pair of annular axially spaced passageways, openings through said body terminating with each annular passageway and, openings through said rotor terminating with each annular passageway thereby forming two fluid passages between the openings in said body and rotor.

4,422,677

## LATCH BOLT HAVING CRANK CAMMING FOR POSITIVE BOLT POSITIONING

Arnold C. Gater, Anaheim, Calif., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Feb. 5, 1981, Ser. No. 232,986
Int. Cl.³ E05C 1/06; E05B 65/06
U.S. Cl. 292—139 6 Claims



1. In a latch construction of the type having a crank hub rotatable in a frame about a transverse axis with a crank arm extending radially therefrom, a longitudinal driving lever with a rearward end pivotally connected to an end portion of the crank arm through a transverse driving pin, a forward end of the driving lever pivotally connected to a longitudinally reciprocal bolt, forward movement of the crank arm by rotation of the crank hub moving the bolt through the driving lever forwardly to an extended position in which the driving pin is simultaneously moved into a generally vertical bolt positioning slot in the frame, the driving pin and bolt positioning slot engagement resisting rearward movement of the bolt out of the extended position from an outside force against the bolt, rearward movement of the crank arm by rotation of the crank hub initially withdrawing the driving pin from the bolt positioning slot while moving the bolt to a retracted position; the improvements including: cam surface means on said rotatable crank hub and resilient means bearing thereagainst cooperably actionable as said bolt approaches and moves into said extended position for resiliently urging said driving pin through said crank hub and crank arm into and resiliently resisting removal from said frame bolt positioning slot; said resilient means including a generally U-shaped spring resiliently bearing between said cam surface means and said frame having a leg abutting said cam surface means and a leg abutting said frame.

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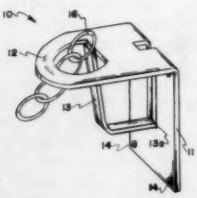
4,422,678

## LATCH

Larry L. Tuckett, 1890 N. Fruitland Dr., and Ronald L. Kendall, 1734 N. Fruitland Dr., both of North Ogden, Utah 84404

Filed Feb. 17, 1981, Ser. No. 234,737
Int. Cl.³ E05C 17/36
U.S. Cl. 292—264 1 Claim



1. A latch device comprising

a connector brace having one end forming an attachment member and another end bent to extend normal to said attachment member and forming a rigid loop;

a tongue member formed by bending a piece of said attachment member and the other end of said connector brace to extend from said attachment member and including a hook extending parrallel to said attachment member and through a central portion of said loop.

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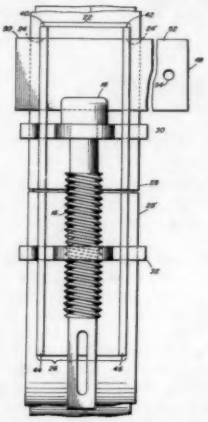
4,422,679

## TAMPER-PROOF FASTENER

Robert A. Ruscitto, Braintree, Mass., assignor to Boston Edison Company, Boston, Mass.

Filed Mar. 25, 1982, Ser. No. 361,517
Int. Cl.³ B05D 33/34
U.S. Cl. 292—307 R 9 Claims



1. A tamper-proof device for protecting and fastening a sealing collar comprising a first bolt disposed proximate to a first wall provided with a transverse slot, the head of said first bolt being provided with a transverse slot aligned with the slot in said first wall; a hard metal tab adapted to transverse the slots in said first wall and the head of said first bolt, said tab having one end bent at a substantial angle and a hole adjacent to the other end; a second bolt passing through said hole; and means for preventing removal of said second bolt; whereby said tab prevents said first bolt from turning and said bent end and second bolt prevent removal of said tab.

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4,422,680

## ENERGY ABSORBING CURVED SECTIONS

Marcel Goupy, Saint Cloud, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

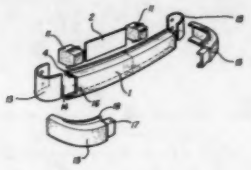
Filed Jun. 3, 1981, Ser. No. 270,015
Claims priority, application France, Jun. 3, 1980, 80 12270
Int. Cl.³ B60R 19/02
U.S. Cl. 293—122 9 Claims

1. A method of forming a composite vehicle bumper comprising:

forming an elongated section which is curved along the elongate axis thereof, said section defining a frontal face as well as upper and lower borders extending perpendicular to said frontal face, providing said upper and lower borders with a first edge formed unitary with an edge of said frontal face which is transverse to said axis and a free edge which is opposite said first edge and which includes a raised portion, wherein said section is formed by pultrusion molding of glass strands impregnated with hardening synthetic resin, including the drawing of said impregnated

strands through a draw plate having a constant curve radius; and

providing at least one closure plate having edges shaped to



matingly engage said free edge by connecting each said closure plate between said free edges at an axial portion of said section which is subject to maximum stress during use.

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**4,422,681**

**ANIMAL EXCREMENT PICKER**

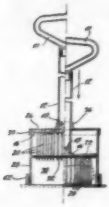
**Sylvain Laroche, 855 Choquette, Beloeil, Canada**

**Filed Jan. 22, 1982, Ser. No. 341,869**

**Claims priority, application Canada, Feb. 17, 1981, 371054**

**Int. Cl.³ A01K *29/00***

**U.S. Cl. 294—1 BA** **5 Claims**



1. An animal excrement picker comprising: a handle having an elongated shank portion with a cross-section of a given shape; a plate secured to one end of said shank; a plurality of spikes mounted to said plate extending downwardly therefrom; a housing having a top wall and sidewall means extending peripherally and downwardly from said top wall to define therewith an enclosure with an open end; a perforated plate mounted within said housing and to said sidewall means, said perforated plate extending parallel to said top wall between said top wall and said open end and including a plurality of openings, each in axial alignment with a respective spike so as to allow passage of said spike therethrough; said top wall having a collar portion with an opening in the region of said handle, said opening having a shape corresponding to that of said shank portion and a dimension such as to cause frictional contact between said handle and said collar portion of said top wall to thereby prevent relative free movement therebetween and to hold said spikes in a lowermost position after an excrement has been spiked.

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**4,422,682**

**DEVICE FOR CHECKING AND RESETTING SMOKE ALARMS**

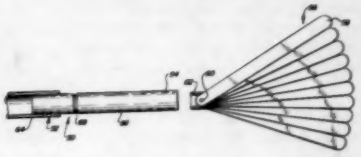
**Thomas P. O'Connell, 5710 S. Sawyer Ave., Chicago, Ill. 60629**

**Filed Nov. 13, 1981, Ser. No. 321,093**

**Int. Cl.³ B25J *1/80***

**U.S. Cl. 294—19 R** **2 Claims**

1. A device for checking and resetting a smoke alarm provided with an internal electrical source for sounding an alarm and adapted to be mounted on a ceiling or a wall, said smoke alarm being provided with test and reset button means, said device comprising an elongated member having one end provided with testing means and the other end provided with smoke wafting means, whereby said testing means are adapted to engage said test and reset button means to activate or reset the smoke alarm, and said smoke wafting means is wafted across an activated smoke alarm to clear the smoke out of the interior of the smoke alarm before it can be deactivated by said testing means, wherein said elongated member comprises a tubular rod having a pair of sections, one section telescopically related with the other section, said smoke wafting means comprising a fan formed by a plurality of overlapping leaves, a housing for supporting said fan, and a pivot pin commonly connecting one set of ends of said leaves and securing same to



said housing, said housing being slidably receivable in the interior of one of said sections, and means for limiting the inward movement of said fan into said one section, whereby, for storing said device, the two sections are telescoped together, the fan leaves are collapsed and the fan and its housing are pushed into the confines of said one section, and wherein said testing means comprises a base attached to said one end of the elongated member, a pair of testing projections extending outwardly from the face of said base, one of said projections terminating in a button, another pair of projections extending out of a side wall of said base, one of said side wall projections terminating in a button, said smoke wafting means comprising a fan structure.

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**4,422,683**

**LEVEL DETECTOR AND ITS APPLICATION TO A GRABBING APPARATUS FOR CONTAINERS OR THE LIKE**

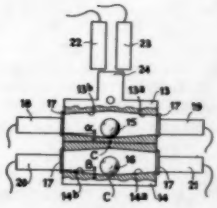
**Henri Charonnat, Pont Saint Martin, France, assignor to Brissonneau et Lotz Marine, Carquefou-Nantes, France**

**Filed Jun. 8, 1981, Ser. No. 271,669**

**Claims priority, application France, Jun. 11, 1980, 80 12955**

**Int. Cl.³ B66C *13/04***

**U.S. Cl. 294—86 LS** **16 Claims**



1. Level detecting apparatus for grabbing apparatus of the type comprising a frame suspended at a point from a manipulating engine, the frame being adapted for connection to a load to be hoisted, the load having an initial inclination, and means for displacing the point of suspension in a reference direction of the frame, the level detecting apparatus comprising a level detector adapted for connection to the frame so as to pivot in a vertical plane parallel to the reference direction and to provide an output signal when the level detector has a predetermined deviation from horizontal, actuating means for pivoting the level detector in said plane, first means responsive to said

output signal for controlling, upon the frame being connected to the load and prior to hoisting, the actuating means so as to pivot the level detector to a horizontal position and for thereafter inhibiting the operation of the actuating means so as to fix the relative position of the level detector with respect to the frame, and second means responsive to said output signal for controlling, upon hoisting of the load, the displacing means so as to position the point of suspension to one in which deviation from horizontal of the level detector is cancelled, and wherein said level detector comprises a tubular body having closed ends and a slightly concave roller track, a ball adapted to roll on the roller track toward one end or the other of the tubular body as a function of the inclination of the level detector with respect to horizontal, and detector means for detecting the presence of the ball at each of said closed ends and for emitting said output signal in response to said detecting.

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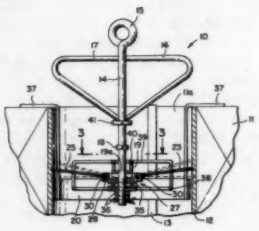
4,422,684

## APPARATUS FOR LIFTING REEL-LESS COILS OF WIRE

George E. Zitzman, 131 Tanners Pond Rd., Garden City, N.Y. 11530

Filed Sep. 22, 1981, Ser. No. 304,630
Int. Cl.³ B66C 1/54
U.S. Cl. 294—97 6 Claims



1. A lifting fixture for operation within cores comprising

a central tension member adapted to be placed within the core and to be connected at its upper end to a carrier device; and

a plurality of lifting bars coupled to the tension member for deflection about axes transverse to the axis of the tension member and extending radially outward the engage the inner wall of the core in an upwardly inclined position, whereby when the tension member is stressed for lifting the bars deflect to press their ends into the walls of the core,

means to limit the downward deflection of the lifting bars comprising an annulus underlying the free ends of the bars and movable axially on the central tension member and stop means on the tension member to afford limited movement of the annulus axially of the tension member.

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4,422,685

## MODULAR CHASSIS AND BODY FOR MOTOR VEHICLES

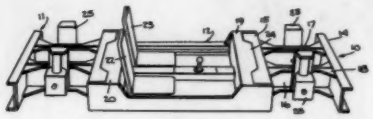
Paul F. Bonfilio, 47-25 198th St., Auburndale, N.Y. 11358, and Richard Stobe, 2229 Marcel Dr., Orange Park, Fla. 32073

Filed Jul. 6, 1981, Ser. No. 280,345
Int. Cl.³ B62D 25/00
U.S. Cl. 296—197 9 Claims

1. In an automobile, a modular structure constituted by pre-formed components which when joined together define the basic chassis of a motor vehicle to which is attachable a body of a selected configuration to create an automobile of any desired style, the structure comprising:

A. a floor tray provided with end couplers and a floor extending therebetween on which seating is mountable;

B. identical front and rear cradles, each of which is joined to a respective coupler to create a chassis; and



C. a sectioned body having a capsule section defining a cockpit having door openings, said capsule section being secured to said floor tray to act as a truss for said chassis.

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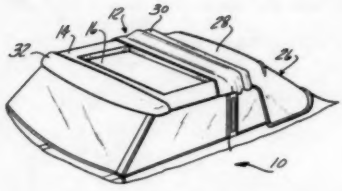
4,422,686

## VEHICLE ROOF STRUCTURE

Ralph Droz, Westland, Mich., assignor to American Sunroof Corporation, Southgate, Mich.

Filed Dec. 7, 1981, Ser. No. 328,212
Int. Cl.³ B60J 7/06
U.S. Cl. 296—219 5 Claims



1. A vehicle roof structure having an opening surrounded by a stationary roof structure adapted to be retractably closed by a folding roof cover comprising:

a pre-formed cap mounted on a rear portion of the stationary roof structure of the vehicle;

a decorative cover having a first portion fixedly secured to the pre-formed cap and a second portion extending flexibly forward therefrom;

a frame mounted in the roof opening and secured to the stationary roof structure along the edges of the roof opening;

guide track means formed along the longitudinal sides of the frame;

pairs of first and second cross bows extending substantially perpendicular to the longitudinal axis of the frame, the pairs of first and second cross bows attached at spaced intervals along the flexible second portion of the cover;

the first cross bow of each pair of cross bows having opposed ends riding in the guide track means for retractably and extensibly sliding the flexible cover over the roof opening;

biasing means, extending between each of the first and second cross bows in each pair of cross bows, for maintaining a predetermined distance between the first and second cross bows;

means, attached to the forward end of certain of the first cross bows of the pairs of cross bows for urging the second cross bows of the adjacent forwardmost pair of cross bows upward and thereover as the flexible portion of the cover is urged in a rearward direction uncovering the roof opening to create folds in the flexible portion of the cover; and

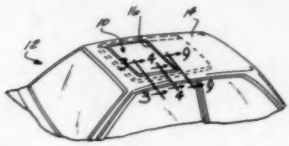
means, attached to the forwardmost first cross bow, for latching the flexible portion of the cover in a fully closed position.

4,422,687

## SLIDING ROOF PANEL ASSEMBLY

Milton C. Kaltz, Allen Park; Edward M. Chojnowski, Northville; David C. Garascia, Novi; Barney J. Bauer, Howell, and Richard D. George, Brownstown, all of Mich., assignors to American Sunroof Corporation, Southgate, Mich.

Division of Ser. No. 196,468, Oct. 14, 1980, Pat. No. 4,379,586.
This application Sep. 29, 1982, Ser. No. 427,429
Int. Cl.³ B60J 7/10
U.S. Cl. 296—221 12 Claims



1. A modular sliding roof panel assembly adapted to be mounted to the stationary roof structure of a veicle having an opening in the roof thereof which is opened and closed by the sliding roof panel, said assembly comprising:

an integral housing adapted to be mounted to the interior of said stationary roof structure of said vehicle, said housing having an aperture therein aligned with said opening in said roof of said vehicle;

a movable roof panel;

guide rails mounted to said housing and extending in the sliding direction of said movable roof panel;

front and rear guide shoes mounted to said movable roof panel and engaging said guide rails for controlling the movement of said movable roof panel between open and closed positions, said front guide shoes being pivotally mounted to said movable roof panel, said rear guide shoes having a first portion slidably engaging said guide rails and a second integral portion positioned over said guide rails and extending laterally outward therefrom;

drive means operably connected to at least one of said front and rear guide shoes for moving said movable roof panel between open and closed positions;

guide blocks mounted to said movable roof panel and having a cam track formed therein, said guide blocks being positioned laterally outward from said guide rails and

cam follower means pivotally mounted to said second portion of said rear guide shoes and engageable with said guide blocks for selectively raising the rear edge of said movable roof panel above said stationary roof structure of said vehicle and for lowering said rear edge of said movable roof panel below said stationary roof structure such that said movable roof panel can slide beneath said stationary roof opening.

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4,422,688

## LATCHING DEVICE FOR A DETACHABLY ATTACHABLE ROOF PANEL IN A VEHICLE

Michitada Kameoka, Musashino, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,635
Claims priority, application Japan, Sep. 9, 1980, 55-128202[U]; Sep. 9, 1980, 55-128203[U]; Sep. 9, 1980, 55-128205[U]
Int. Cl.³ B60J 7/18
U.S. Cl. 296—224 5 Claims

1. In a latching device for a detachably attachable type roof panel in a vehicle, comprising:

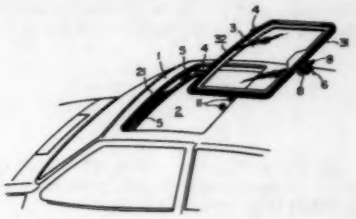
(a) a roof of the vehicle having an opening formed in one part thereof, said opening having an inner peripheral brim;

(b) a roof panel of a size to be snugly fitted in said opening of said roof in a detachably attachable manner;

(c) a detachably attachable hinge member provided on the front edge of said roof panel and which is engaged with the inner peripheral brim of said roof opening;

(d) a toggle latch provided on the rear edge of said roof panel to be also engaged with said inner peripheral brim of said roof opening, said toggle latch having link members; and

(e) a pivotal shaft for connecting one of said link members of said toggle latch and said roof being inserted and withdrawn by the expanding and contracting operations of a connecting shaft for the link members through said link



members, and said pivotal shaft being maintained in its fitted state by a spring provided on the connecting shaft, the improvement comprising:

a locking mechanism which positively prevents contraction to a release position of said expanding and contracting connecting shaft in one position of said locking mechanism and means for permitting moving said locking mechanism to a position at which it does not prevent contraction of said connecting shaft when said roof panel is to be removed from said roof opening, said locking mechanism being provided on said toggle latch.

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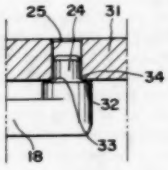
4,422,689

## LOCKING DEVICE FOR DETACHABLE PANEL OF VEHICLE ROOFS

Junji Yamamoto, Nagoya; Noboru Kanou, and Masayuki Usami, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jan. 13, 1981, Ser. No. 224,844
Claims priority, application Japan, Jan. 19, 1980, 55-4953
Int. Cl.³ B60J 7/08
U.S. Cl. 296—224 4 Claims



1. A locking device for a panel adapted to be detachably fitted in an opening of a vehicle roof, the panel being hinged at a front edge thereof to the vehicle roof, comprising:

(a) a lever pivotally mounted on the detachable panel near a rear edge of said panel;

(b) a stationary body securely fixed to the underside of the vehicle roof and having a pair of parallel, spaced-apart arms, each arm having an opening, said openings generally facing one another; and

(c) a link mechanism having a bracket securely fixed to said lever and having a pair of links, each link having one of its ends pivoted to said bracket and having a seating face at

its other end and a pivot pin projecting from said seating face and adapted to be pivotally and releasably mounted in said opening in one of said arms, said links being resiliently biased in opposite directions such that said pivot pins are resiliently biased away from one another, each of said pivot pins being tapered from the portion thereof adjoining said seating face to its tip, and at least a portion of the interior surface of each of said openings being arcuate, when viewed in longitudinal cross section, for permitting linear engagement of each of said pins with said interior surface of an individual one of said openings, whereby said links are adapted to be resiliently mounted on said stationary body in a substantially rattle-free manner.

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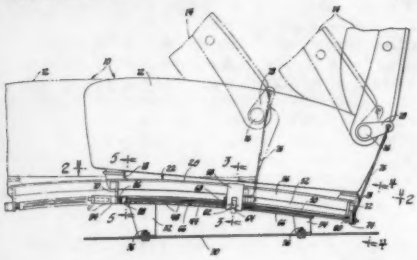
4,422,690

## SEAT POSITION CONTROL MECHANISM

Leonard F. Kopich, Madison Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 22, 1981, Ser. No. 275,833
Int. Cl.³ B60H 1/04
U.S. Cl. 297—341 4 Claims



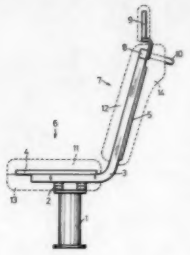
1. In a vehicle seat including a seat cushion, a seat back supported thereon for movement between an upright position and a tilted position, and a pair of track members for mounting the seat on a vehicle for relative longitudinal movement to a plurality of adjusted positions and an easy enter position, a seat position control mechanism comprising, in combination, a plurality of longitudinally spaced first locating means on one of the track members, a second locating means on the other track member, locator means movably mounted on the other track member for movement therewith and movement relative thereto, means biasing the locator means to a normal position in engagement with a first locating means and the second locating means to lock the track members in an adjusted position, operable means for moving the locator means to a seat adjustment position out of engagement with one of the first locating means while remaining in engagement with the second locating means to unlock the track members and permit movement of the track members to another adjusted position, and means alternately responsive to movement of the seat back to tilted position or actuation of the operable means for moving the locator means out of engagement with the second locating means while remaining in engagement with a first locating means to unlock the track members and permit the track members to move from an initial starting position to the terminal position, movement of the seat back to upright position or de-actuation of the operable means permitting movement of the track members from the terminal position to the initial starting position and re-engagement of the locator means with the second locating means under the action of the pawl biasing means to again lock the track members in the initial starting position.

4,422,691

## PASSENGER SEAT

Ignaz Vogel, Kleinsteinbacher Str. 44, Karlsruhe 41, Fed. Rep. of Germany 7500

Filed Jun. 17, 1981, Ser. No. 274,491
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1980, 3022640
Int. Cl.³ A47C 4/02
U.S. Cl. 297—440 4 Claims



1. A passenger seating arrangement for installation in vehicles such as buses, railroad cars, boats and airplanes, said seating arrangement comprising: a support frame consisting of support legs with at least two seat support beams mounted on, and interconnecting, said legs, at least one seat mounted on said support frame, said seat including two support tubes mounted on said support beams, a seating plate mounted on top of said support tubes and a backrest plate mounted behind said support tubes, the seating and backrest plates being interconnected by said support tubes, said support tubes having open upper ends, upholstery members mounted on top of the seating and the front of the backrest plates and cover parts mounted on the rear of said backrest plate, a bridging tube inserted into the open ends of said support tubes, said bridging tube carrying a headrest, and a handle integral with said bridging tube and projecting rearwardly therefrom beyond the cover parts of said backrest plate.

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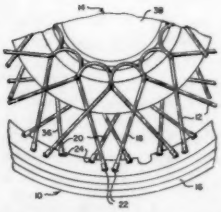
4,422,692

## SIMULATED WIRE WHEEL TRIM FOR AUTOMOBILE WHEELS

Don W. McClure, Sterling Heights, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 26, 1981, Ser. No. 267,166
Int. Cl.³ B60B 7/00
U.S. Cl. 301—37 SS 9 Claims



1. A simulated wire wheel cover comprising: a circular rim member; a spoke array composed of a plurality of interconnected spoke members welded to one another at the point where end spoke member comes in contact with the adjacent spoke member in said array; the radially outer end of said spoke array capable of engaging and positioning said circular rim member, said rim member provided with holes to receive

the radially outer end of said spoke members; a center hub member fastened to and supported by the central portion of said spoke array; and wheel retention means attached to said rim member.

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**4,422,693**

## VEHICLE BRAKING SYSTEMS

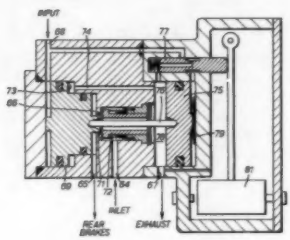
**Glyn Phillip R. Farr, Leek Wooton, England, assignor to Lucas Industries Limited, Birmingham, England**

**Continuation-in-part of Ser. No. 148,670, May 12, 1980, abandoned. This application Aug. 17, 1982, Ser. No. 408,854**

**Claims priority, application United Kingdom, May 10, 1979, 7916298**

**Int. Cl.³ B60T *8/16, 8/26***

**U.S. Cl. 303—24 A** **4 Claims**




1. A pressure regulating device for a vehicle braking system in which a continuous supply of brake actuating fluid is available from a power source, the device comprising: an inlet for receiving brake actuating fluid from said power source; an outlet for connection to a rear brake of the vehicle; sensing means for sensing deceleration of the vehicle; valve means for connecting the outlet to the inlet in order to supply fluid from the inlet to the outlet to increase the pressure supplied to the rear brake and for connecting the outlet to exhaust in order to reduce the pressure supplied to the rear brakes; and control means for controlling operation of said valve means, said control means being responsive to a control pressure selected by the driver of the vehicle, to rear brake pressure of the vehicle, and to said sensing means, and being operative at any particular control pressure to operate the valve means to maintain the relationship:

$$AP_1 - BP_2 + C = Df$$

where:

$P_1$ is the control pressure;

$P_2$ is the rear brake pressure;

f is the sensed deceleration;

A, B, and D are constants with A being greater than B; and C is an optional constant.

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**4,422,694**

## BRAKING PRESSURE CONTROL UNIT FOR A HYDRAULIC BRAKE SYSTEM

**Bernd Schopper, and Volker Berisch, both of Hattersheim, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.**

**Continuation of Ser. No. 244,999, Mar. 18, 1981, abandoned. This application Jan. 4, 1983, Ser. No. 455,448**

**Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016207**

**Int. Cl.³ B60T *11/32***

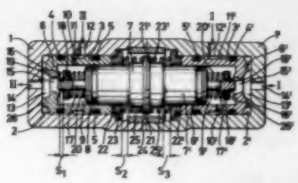
**U.S. Cl. 303—84 A** **34 Claims**

1. A braking pressure control unit for a hydraulic brake system having brakes at the wheels of one axle connected to two different brake circuits comprising:

a casing having an intermediate piston disposed therein coaxial of a longitudinal axis, said piston being movable from its rest position in both directions relative to said casing;

two differential pistons disposed coaxial of said axis in tandem relationship in said casing and slidable in said casing against a preloading force in opposite directions, said two differential pistons being preloaded and bearing against one another by means of a common spring device;

a valve device having a valve seat and a valve closure member associated with each of said differential pistons and said intermediate piston, each of said valve devices having one of said valve seat and said valve closure member



coupled to a different one of said differential pistons and the other of said valve seat and said valve closure member coupled to an adjacent end of said intermediate piston, each of said valve devices connecting a pressure inlet chamber of an associated one of said brake circuits to a pressure outlet chamber of said associated one of said brake circuits; and

means associated with each of said differential pistons and said intermediate piston, which upon failure of one of said brake circuits, ensures that said valve device of the intact brake circuit is in its open position.

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**4,422,695**

## ANTI-SKID BRAKING SYSTEM FOR VEHICLES

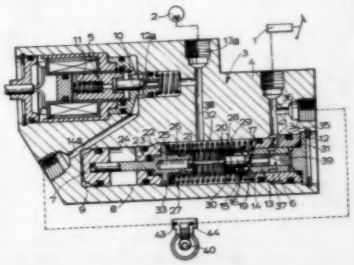
**Glyn Phillip R. Farr, Wootton, England, assignor to Lucas Industries Limited, Birmingham, England**

**Filed Jan. 7, 1982, Ser. No. 337,760**

**Claims priority, application United Kingdom, Jan. 14, 1981, 8101108; May 12, 1981, 8114404; May 12, 1981, 8114405; May 21, 1981, 8115716; Sep. 11, 1981, 8127546**

**Int. Cl.³ B60T *8/02***

**U.S. Cl. 303—115** **6 Claims**



1. An anti-skid hydraulic braking system for vehicles comprising a wheel, a brake for braking said wheel, a source of brake-applying pressure for applying said brake, means for sensing skid conditions at said wheel at a skid point during braking and for producing a skid signal at said skid point, and a modulator responsive to said skid signal to relieve said brake-applying pressure by displacing fluid from said brake, said modulator including a brake-reapplication restrictor which is operative to control the rate at which said brake-applying pressure from said source can be re-applied to said brake at the cessation of said skid signal, wherein a valve assembly is incor-

porated to by-pass said reapplication restrictor, said valve assembly comprising first and second valve members which are relatively movable between a spaced inoperative position in which unrestricted communication is provided between said source and said brake and an operative position in which said valve members are urged into engagement to render said restrictor operative, means for urging said first valve member into engagement with said second valve member in response to said skid signal, and means for urging said second valve member into engagement with said first valve member in response to any difference in fluid pressure acting across restrictor.

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**4,422,696**

**TRACK STRUCTURE FOR A TRACKED VEHICLE**

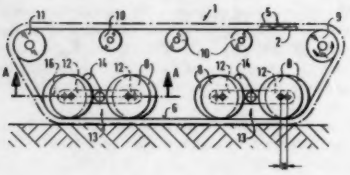
**Horst Seit, Steinbach, Fed. Rep. of Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Oct. 24, 1980, Ser. No. 200,381**

**Claims priority, application Fed. Rep. of Germany, Oct. 25, 1979, 2943066**

**Int. Cl.³ B62D *55/14***

**U.S. Cl. 305—28** **5 Claims**



1. In a track-laying military vehicle, the improvement which comprises track assembly having:

an endless track composed of a multiplicity of tread links spaced apart by linear gaps extending the width of the track and means pivotally connecting said links together only at the end of said gaps whereby said gaps each have a width x between respective tread links; and

roller means supporting said track with a lower ground-engaging stretch and an upper return stretch, said roller means including an arm connected to said vehicle, and a pair of running wheels journaled on said arm and bearing upon running surfaces of said tread links at least in the region of said lower stretch, said wheels being journaled on said arm with an interaxial spacing X wherein $1x \leqq X \leqq 1.5x$, the axes of said wheels being fixed on the respective arm and lying in a plane parallel to the plane of said running surfaces of said lower stretch.

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**4,422,697**

**ROTARY ROLLER BEARING CONNECTION WITH A FREE CENTER**

**Georg Gugel, Nuremberg, and Theodor Kaiser, Hochstadt, both of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany**

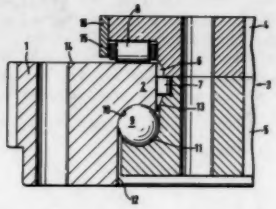
**Filed Sep. 8, 1981, Ser. No. 300,240**

**Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3034008**

**Int. Cl.³ F16C *19/49***

**U.S. Cl. 308—175** **7 Claims**

1. A ring-rolling bearing connection with a free center comprising two concentric races, one race having a circular slot open towards the other race, the other race having a circular protrusion engaging the said slot with spacing on all sides, and crylindrical rollers being provided between the outer surface of the protrusion, on the one hand, and the corresponding surface in the slot, on the other hand, to absorb radial forces, and one row each of rolling elements between the corresponding faces of the protrusion, on the one hand, and corresponding faces of the slot, on the other hand, to absorb axial forces, of which at least the row transmitting the main axial load consists of cylindrical rollers, characterized in that, in the area of a retaining row of rolling elements facing the rolling elements and absorbing only the lifting tilting moment, both on the



protrusion's adjacent radial surface its axially facing retaining row, and at the slot portion opposite the said retaining row there are provided sections of circular arc form whose radii correspond at least to the radius of the rolling elements disposed in the retaining row.

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**4,422,698**

**BEARING ASSEMBLY**

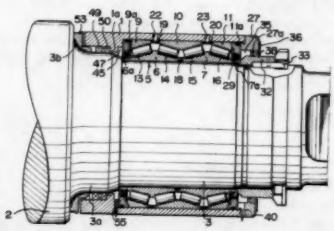
**Akio Aoki, and Kenichi Uchida, both of Fujisawa, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 976,643, Dec. 20, 1978, abandoned. This application Nov. 6, 1980, Ser. No. 204,546**

**Claims priority, application Japan, Dec. 24, 1977, 52-155993; Aug. 2, 1978, 53-93663**

**Int. Cl.³ F16C *1/24, 33/78***

**U.S. Cl. 308—187.1** **11 Claims**

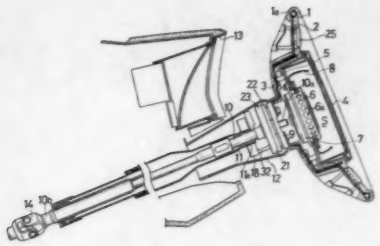


1. In rolling mill apparatus of the type having a bearing assembly supporting a rotatable roll neck of a mill roll for rotation about an axis on a fixed chock, the bearing assembly including an outer race, an inner race, and rolling elements therebetween, and the bearing assembly including seal means between the inner and outer races for sealing the rolling elements in a region between the inner and outer races, the improvement comprising chamber means disposed adjacent to and axially outward of said seal means, means for restricting entry of contaminants to said chamber means from the exterior of said assembly, and discharge means positioned axially outward of said seal means for discharging from said chamber means contaminants which enter said chamber means through said restricting means, said discharge means comprising a discharge opening formed through said chock for draining contaminants from said chamber means along a path separated from the entry of said contaminants into said chamber means.

## 4,422,699
## ELECTRICAL CONNECTOR DEVICE IN A VEHICULAR STEERING SYSTEM

Yoshimi Sakurai, Tanashi; Yutaka Shinoda, and Hideo Nagata, both of Hiratsuka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha & Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1981, Ser. No. 309,441
Claims priority, application Japan, Oct. 7, 1980, 55-140241; Oct. 7, 1980, 55-140242; Oct. 7, 1980, 55-140244
Int. Cl.³ H01R 39/32
U.S. Cl. 339—3 S 4 Claims



1. An electrical connector device in combination with a steering system having a rotatable member including a steering wheel and a steering shaft, and a fixed member including a steering column, said connector device comprising:

a movable casing supported on said rotatable member for rotation therewith said disposed around said steering shaft, said movable casing having a first terminal;

a stationary casing fixedly supported on said fixed member and disposed around said steering shaft, said stationary casing having a second terminal;

at least one chamber defined between said movable and stationary casings;

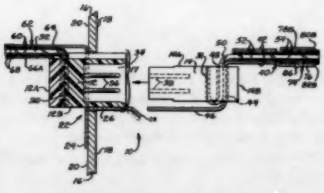
an electrical conductor coiled in a plurality of convolutions in said chamber around said steering shaft and connected at one end thereof to said first terminal and at the other end thereof to said second terminal; and

said movable casing being axially immovable with respect to said stationary casing and axially movable with respect to said rotatable member.

## 4,422,700
## GROUNDED MULTI-PIN CONNECTOR FOR SHIELDED FLAT CABLE

Horst M. Krenz, St. Joseph, Mich., assignor to Heath Company, St. Joseph, Mich.

Filed Jan. 6, 1982, Ser. No. 337,360
Int. Cl.³ H01R 4/66
U.S. Cl. 339—14 R 14 Claims



1. A grounded multi-pin connector mounted in an aperture in a grounded panel and electrically coupling first and second segments of a multi-conductor, flat cable enclosed in a conductive shield wherein said second segment is enclosed in an insulative sheath, said connector comprising:

a first housing connected to said first cable segment, said first housing including a recessed portion wherein are located a plurality of conductive pins in a fixed planar array;

a second housing with a slot therein and having a plurality of conductive receptacles connected to said second cable segment and arranged in a fixed planar array such that when said second housing is inserted in the recessed portion of said first housing, electrical connection between said first and second cable segments is established;

first conductive means having first, second and third sections;

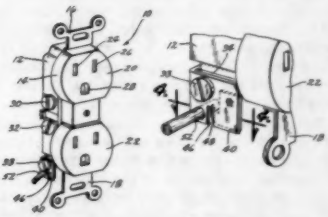
means for mounting said first conductive means between said first housing and said panel such that the first section of said first conductive means is electrically grounded, the second section thereof extends through said aperture adjacent said first housing, and said third section engages the conductive shield of the first segment of said flat cable thereby grounding said conductive shield; and

second conductive means having a bent portion positioned in the slot of said second housing and adapted to securely engage said insulative sheath and electrically communicate with the conductive shield of said second segment, a section of said second conductive means extending in a generally parallel direction to said second housing and in close proximity thereto for contacting the second section of said first conductive means when said first and second housings are mated thereby grounding the conductive shield of the second segment of said flat cable.

## 4,422,701
## ELECTRICAL RECEPTACLES

Raymond G. Anderson, 206 N. Sharmin St., Ankeny, Iowa 50021

Continuation of Ser. No. 157,562, Jun. 9, 1980, abandoned. This application Aug. 23, 1982, Ser. No. 410,650
Int. Cl.³ H01R 3/04
U.S. Cl. 339—14 R 5 Claims



1. An outlet plug receptacle comprising,

an insulated housing having wall portions forming a chamber for holding power terminals and a ground terminal therewithin,

an electrical cover means for said housing having at least one plug receiver,

at least one plug mounting strap positioned between said housing and said cover to fix said receptacle to an outlet box,

at least two power wire terminals mounted within said housing chamber,

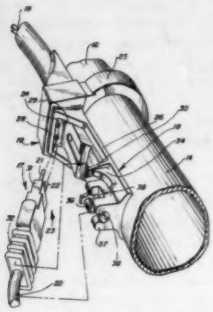
a ground terminal having a threaded aperture in said mounting strap and a mated threaded screw for securing a ground wire by turning said screw down upon said ground wire, and

a quick wiring, stab-in, ground terminal arranged to receive a ground wire and grip the same, said ground terminal being formed at least in part as an integral portion of said plug mounting strap and being removably secured to said mounting strap by said ground terminal screw.

## 4,422,702
## VACUUM CLEANER ELECTRICAL CONNECTOR

Erwin E. Nordeen, St. Paul, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 28, 1981, Ser. No. 306,283
Int. Cl.³ H01R 4/64
U.S. Cl. 339—15 10 Claims



1. In a vacuum cleaner structure having a tubular air conducting wand provided at one end with connecting means for removable connection to a suction hose end having an electrical connection mounted thereto, the improvement comprising:

a plug housing provided on said one end of the wand; and

electrical conducting means including a plug and conductor cord means for providing an electrical supply extension from said hose electrical connection, said plug housing defining a base portion carried by said one end of the wand, a guide portion having a through opening aligned with said electrical connection on said hose end as an incident of mechanical connection of said one end of the wand to said suction hose end, a rigid plug stop shoulder on said hose spaced from said guide portion a preselected distance for effectively preventing movement of the plug outwardly from the guide portion through opening when the plug is in an installed disposition with one end of the plug received in said guide portion opening and the other end of the plug juxtaposed inwardly of said stop shoulder, and retaining means on said base outwardly of said stop shoulder for releasably retaining said conducting means from movement away from said base, said guide portion of the plug housing defining an inclined guide surface spaced from said base portion outwardly adjacent and extending toward said through opening and facing toward said plug stop shoulder and conducting means retaining means for slidably guiding said one end of the plug into said opening and said other end of the plug extending angularly outwardly away from the base adjacent said plug stop shoulder and conducting means retaining means, thereby permitting said other end of the plug to be moved inwardly toward the base to said installed disposition.

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## 4,422,703
## ELECTRICAL CONNECTOR FOR USE WITH MULTI-PIN ARRAYS

Gordon D. Christensen, San Jose, and Charles J. Donaher, Los Altos Hills, both of Calif., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Sep. 15, 1981, Ser. No. 302,445
Int. Cl.³ H01R 13/629
U.S. Cl. 339—74 R 14 Claims

1. An electrical connector for interconnecting a plurality of terminal pins in predetermined array to companion apparatus, comprising:

(a) a housing;

(b) a plurality of contacts supported by said housing in said array and extending in a common direction, each such contact having a first terminal for connection to said companion apparatus and a second terminal adapted for receiving one such terminal pin and having facing elements self-biased into preselected attitude; and

(c) a plate member defining apertures in registry with and for receipt of said second terminals, said plate member being supported for movement in said housing in said common direction between a first position wherein said

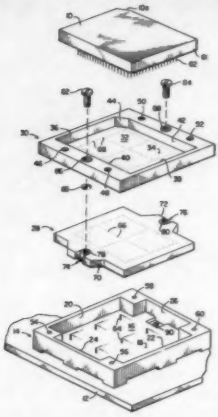

plate member engages said facing elements of all such second terminals to oppose such self-bias thereof and displace said facing elements from said preselected attitude whereby said pins may be readily received in said second terminals, and a second position wherein said plate member does not oppose said second terminal self-bias whereby said facing elements may exert full force of said self-bias upon pins therebetween.

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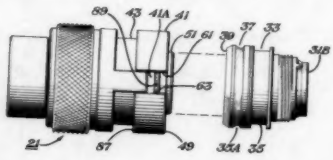
## 4,422,704
## LATCH

Robert A. Williams, 2721 White Settlement, Fort Worth, Tex. 76107

Filed Jan. 5, 1982, Ser. No. 337,156
Int. Cl.³ H01R 13/629
U.S. Cl. 339—91 R 7 Claims



1. A latch, comprising:

a body having a forward end with space surrounded by a wall for receiving, in a latching position, one end of a member having an outer annular groove at said one end,

in said latching position, said outer annular groove of said member being located within said space at said forward end of said body,

an inner annular groove formed in the inner portion of said wall at said forward end of said body at a position such that said inner annular groove of said body is in the same plane as said outer annular groove of said member when

said one end of said member is located within said space at said forward end of said body in said latching position,

the outer portion of said wall at said forward end of said body having at least one axially extending groove formed therein which intersects said inner annular groove forming an opening which exposes said inner annular groove through said axially extending groove,

annular coiled spring means located in said inner annular groove,

a sleeve carried by said body for axial sliding movement between forward and rearward positions,

an arm extending from the forward end of said sleeve for sliding movement in said axially extending groove as said sleeve is moved axially between said forward and rearward positions,

in said rearward position of said sleeve, said arm allowing the said annular coiled spring means to extend partially through said opening allowing said one end of said member to be located within said space at said forward end of said body in said latching position,

in said forward position of said sleeve, said arm forcing the portion of said annular coiled spring at said opening inward into space at said forward end of said body and into said outer annular groove of said member when said one end of said member is located within said space at said forward end of said body in said latching position to latch said body and said member together.

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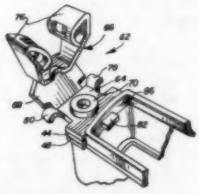
**4,422,705**

## CABLE STRAIN RELIEF FOR AN ELECTRICAL CONNECTOR

**Alan H. Kasper, Cicero, Ill., assignor to Allied Corporation, Morris Township, Morris County, N.J.**

**Filed Aug. 10, 1981, Ser. No. 291,352**
**Int. Cl.³ H01R *13/58***
**U.S. Cl. 339—103 M** **11 Claims**



1. A strain relief system for an electrical connector having housing means including a mounting flange, comprising:

a cable clamp mounted on said flange for restraining movement of a cable connected to said connector;

said cable clamp being configured such that tension applied to said cable tends to bend said flange; and

said cable clamp including means engaging said housing means for resisting bending of said flange.

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**4,422,706**

## ELECTRICAL CONNECTOR PLUG WITH RECEPTACLE ASSEMBLY

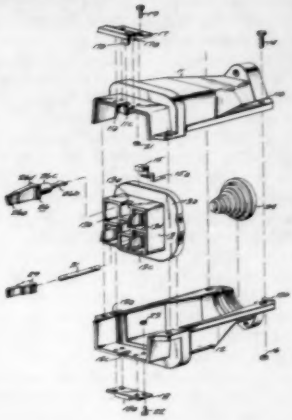
**Don E. Neuhouser, Point Pleasant, W. Va., assignor to Power Distribution Products, Inc., Point Pleasant, W. Va.**

**Filed Jun. 8, 1981, Ser. No. 271,385**
**Int. Cl.³ H01R *13/58***
**U.S. Cl. 339—107** **8 Claims**

1. In combination, an electrical connector pair comprising a male plug and a female receptacle adapted for engagement to complete an electrical circuit comprising

a male plug housing, and a female receptacle housing;

two identical one-piece insulators, each having a plurality of contact compartments, means securing a first one of said insulators in said male plug housing, and means securing a second one of said insulators in said female receptacle housing; top and bottom determining members for mounting on said male plug housing for defining a top and bottom of said male plug housing, said female receptacle housing including a top determining member and said insulators having a keyway in their top portion which cooperates with said top determining members of said male and female housings to insure correct assembly of said insulators therein,



a plurality of male electrical contacts each having at least one blade portion at one end and an integral cable terminal at the other end,

means mounting said male electrical contacts in respective ones of the contact compartments of said first insulator,

a plurality of female electrical contacts, each having at least one generally U-shaped portion at one end and an integral cable terminal at the other end; and

means mounting said female electrical contacts in respective ones of the contact compartments of said second insulator.

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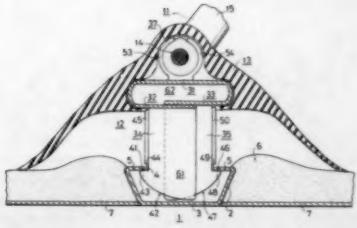
**4,422,707**

## CRT ANODE CAP

**Kazuo Wada; Toshita Chihara, both of Yokohama; Tetsuya Saito, and Mitsuo Suzuki, both of Tokyo, all of Japan, assignors to Taisho Denki Kogyo Kabushiki Kaisha and Sony Corporation, both of Tokyo, Japan**

**Filed Aug. 27, 1981, Ser. No. 296,869**
**Claims priority, application Japan, Aug. 29, 1980, 55-122477**
**Int. Cl.³ H01R *4/48***
**U.S. Cl. 339—143 R** **3 Claims**



1. A CRT anode cap which is provided with an insulated high-tension lead, an anode structure electrically connected with the free end of the insulated high-tension lead for engagement with a CRT anode button, and an insulating cap provided

at one end portion of the insulated high-tension lead for housing the anode structure, wherein the anode structure has a first conductive plate member, second and third conductive plate members extending from left and right free end portions of the first conductive plate member and folded back to the right and the left, respectively, to underlie the first conductive plate member in opposing relation thereto, fourth and fifth conductive plate members extending downwardly from the rear free end portions of the second and third conductive plate members, respectively, and sixth and seventh conductive plate members extending from the front and rear free end portions of the first conductive plate member, respectively; wherein the fourth conductive plate member has, in its lower left portion, a first anode button engaging piece provided with a first stepped portion extending outwardly to the left and a first slope extending down therefrom to the right, and a first flange receiving facet extending upwardly from the first stepped portion; wherein the fifth conductive plate member has, in its lower right portion, a second anode button engaging piece provided with a second stepped portion extending outwardly to the right and a second slope extending down therefrom to the left, and a second flange receiving facet extending upwardly from the second stepped portion; wherein the fourth and fifth conductive plate members constitute an engaging portion for engagement with the CRT anode button; wherein the first, second and third conductive plate members constitute a radioactive rays shielding portion for shielding radioactive rays emanating from the side of the CRT anode button; wherein the sixth conductive plate members is electrically connected with the insulated high-tension lead; and wherein the seventh conductive plate member holds the insulated high-tension lead.

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**4,422,708**

## SUPPORT DEVICE FOR INTEGRATED CIRCUIT

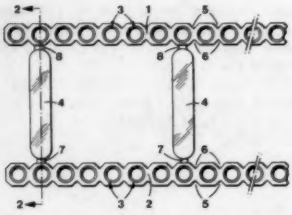
**Jean Birnholz, Monthey, Switzerland, assignor to Ultra-precision, S.A., Monthey, Switzerland**

**Filed Apr. 6, 1981, Ser. No. 251,203**

**Claims priority, application Switzerland, Jun. 13, 1980, 4575/80**

**Int. Cl.³ H01R *13/514***

**U.S. Cl. 339—176 MP** **4 Claims**



**1.** A support device for an integrated circuit in the form of a block having rows of pins along opposing edges thereof for engagement with corresponding sockets carried by a support device, said support device being adapted to be mounted on a circuit board and comprises a unitary structure having two elongated parallel portions formed of insulating material each provided with socket receiving holes spaced to cooperate with the spacing of the pins of the integrated circuit block and a plurality of transverse bridges of insulating material rigidly connecting said two parallel portions to provide a perfect register of the centers of the two series of holes with the pins of the integrated circuit so that the two series of sockets carried by said socket receiving holes will precisely register with the pins of the integrated circuit on the support device.

**4,422,709**

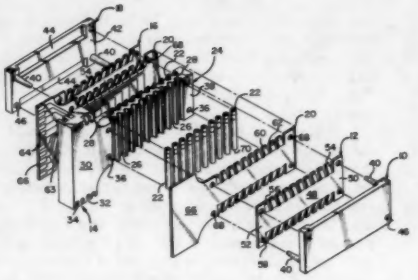
## MULTIPLE TRANSDUCER CONNECTOR

**Dana Croci, and David A. Kaplon, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.**

**Filed Sep. 28, 1981, Ser. No. 306,039**

**Int. Cl.³ H01R *23/66***

**U.S. Cl. 339—176 MF** **2 Claims**



**1.** An electrical connector for terminating a plurality of cylindrical-shaped electrical devices having electrical contact surfaces at each end to a circuit film having conductive traces extending from an enlarged end outwardly to tabs spaced along and projecting from each longitudinal side of an elongated portion, said connector comprising:

a. a housing of insulating material having an elongated block with a plurality of spaced-apart cavities extending transversely across the block and further having at one end of the block means to receive the enlarged end of the circuit film;

b. a spring element of resilient material having a web with spring fingers projecting from each longitudinal side thereof in the same spaced-apart pattern as the tabs on the circuit film and the cavities in the elongated block, said fingers being preloaded by being bent out of the plane of the web, said element

being attachable to the elongated block with the fingers in registration with the cavities so that upon placing electrical devices in the cavities and the elongated portion of the circuit film between the block and the spring element, the spring fingers thereon bias the circuit film tabs against the electrical contact surfaces at each end of the electrical devices to establish electrical contact therebetween.

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**4,422,710**

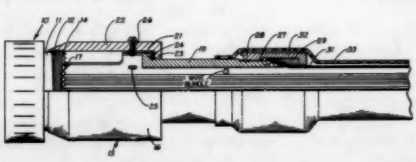
## REPAIRABLE BACKSHELL ADAPTER FOR ELECTRICAL CONNECTOR

**Brian J. Perona, Indianapolis, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Dec. 21, 1981, Ser. No. 333,157**

**Int. Cl.³ H01R *17/18***

**U.S. Cl. 339—177 R** **2 Claims**



**1.** An electrical cable assembly comprising:

an electrical connector having a backshell provided with a threaded section and a plurality of aft extending teeth thereon;

a plurality of wires extending aft from said connector through said backshell;

a terminator surrounding a portion of said wires and having at least one segment of teeth engageable with a portion of said backshell teeth, said terminator having a tapered surface on its aft end and a threaded section adjacent said tapered surface;

a barrel threadedly engageable with said threaded section on said backshell for biasing said segment of teeth on said terminator with said teeth on said backshell;

means for locking said barrel to said terminator;

a clamping sleeve adjacent said tapered surface on said terminator;

a shielded cable surrounding a portion of said wires and having one end positioned between said tapered surface and having one end positioned between said tapered surface and said clamping sleeve; and

a locking nut engageable with said threaded section adjacent said tapered surface for biasing said clamping sleeve to wedge said shielded cable between said tapered surface on said terminator and said clamping sleeve.

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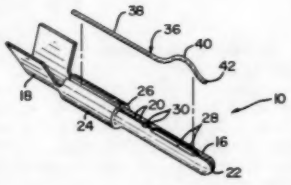
## 4,422,711
## ACTIVE PIN CONTACT

James P. Wolowicz, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 21, 1981, Ser. No. 333,231
Int. Cl.³ H01R 11/22
U.S. Cl. 339—252 R 7 Claims




1. An active electrical pin contact including a hollow pin contact section and a conductor-connecting section for electrical connection with an electrical conductor, a spring member secured in said pin contact section, characterized in that

said hollow pin contact section being partly formed with a rounded nose portion and with edges to be abutted including opposed recessed areas therealong to form a longitudinal slot being spaced a predetermined distance from each other forming a longitudinal gap therealong;

said spring member having a linear section, a bowed section and a short front section which has a curved configuration reverse to that of said bowed section;

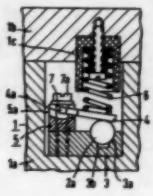
said spring member being inserted into said hollow pin contact section through said longitudinal gap with said linear section extending along an inside surface of said hollow pin contact section, said bowed section having a contact-engaging section extending above an outside surface of said hollow pin contact section within the opposed recessed areas and said curved front section extending along said inside surface spaced from an inside curved surface of the partly-formed nose portion;

said hollow pin contact section being formed into its final configuration with said edges in abutment thereby permitting at least said curved front section to move along said inside surface when an inward force is exerted onto said contact-engaging section.

## 4,422,712
## HOUSED CONTACT ARRANGEMENT FOR A TUBULAR LAMP

Günther Koszytorz, Penzberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 16, 1981, Ser. No. 312,156
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040538
Int. Cl.³ H01R 13/187
U.S. Cl. 339—255 R 4 Claims




1. A contact arrangement of the type which provides electrical communication with a lamp contact terminal of a tubular lamp which is arranged in a housing, the lamp contact terminal having a selectable one of spherical and cylindrical configurations, the arrangement comprising:

contact means having a substantially semicylindrical recess for engaging the lamp contact terminal;

support block means electrically coupled with said contact means and arranged beside said substantially semicylindrical recess of said contact means, said support block means having a recess therein extending transverse to said substantially semicylindrical recess of said contact means;

pressure plate means having a first portion retained in contact with said recess in said support block means, and a second portion for contacting the lamp contact terminal;

cover means for closing the housing; and

resilient spring means mechanically connected to said cover means for applying a force between said cover means and said pressure plate means upon closure of said cover means.

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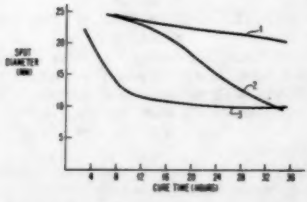
## 4,422,713
## METHOD FOR MAKING HIGH EFFICIENCY HOLOGRAMS

Barbara D. Grant, San Jose; Magdalena M. Hilden, Felton; Carol R. Jones, and Glenn T. Sincerbox, both of San Jose, all of Calif., assignors to International Business Machines, Armonk, N.Y.

Filed Apr. 16, 1982, Ser. No. 369,284
Int. Cl.³ G03H 1/18; G03C 5/22
U.S. Cl. 350—3.61 11 Claims




1. In a process for making high efficiency holograms from dichromated gelatin (DCG), the improved method comprising the steps of:

curing the DCG for a specified time under specified temperature and humidity conditions;
placing a dye spot on the cured DCG material;
measuring the extent of diffusion of the dye spot after a predetermined time;
repeating the method until dye spot diffusion of a predetermined size occurs; and
using the material at that cure state to make holograms.

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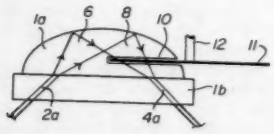
**4,422,714**

## ELLIPSOIDAL OPTICAL COUPLING DEVICE

**Pierre Benoit, Cortaillod; Jean-Paul Pellaux, Neuchatel; Gilbert Widmer, Le Landeron, all of Switzerland; Betty Kerllenevich, Bahia Blanca, Argentina, and Andre Coche, Strasbourg, France, assignors to Cables Cortaillod S.A., Switzerland**

**PCT No. PCT/CH80/00103, § 371 Date Mar. 17, 1981, § 102(e) Date Mar. 17, 1981**
**PCT Filed Sep. 12, 1980, Ser. No. 245,647**
**Claims priority, application Switzerland, Sep. 14, 1979, 8328/79; Jun. 16, 1980, 4606/80**
**Int. Cl.³ G02B 5/172**
**U.S. Cl. 350—96.15** **22 Claims**




1. An optical coupling device for at least two light conductors, comprising a solid body at least a part of which consists of a half-ellipsoid of revolution made of a material transparent at least in the wavelength range of the light transmitted by these light conductors, the outer surface of said half-ellipsoid being placed in an ambient medium, means for positioning the end of one of said light conductors at one of the foci of said half-ellipsoid, second means for positioning the end of a second light conductor at the other focus of said half-ellipsoid, said positioning means orienting the optical axes of the two conductors whose ends have been placed at the foci of the half-ellipsoid in such a way that a divergent light beam emitted by one of these conductors is transformed, after having undergone a total reflection inside said half-ellipsoid, at the interface between said half-ellipsoid and said ambient medium into a beam converging on the end of the other conductor, said half-ellipsoid including a slot formed therein to permit the interposition along the path of said convergent beam of beam modifying means operative to modify a light beam transmitted through said half-ellipsoid.

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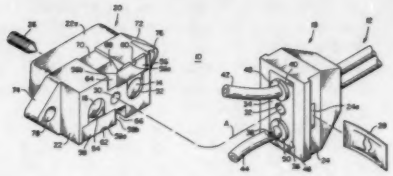
**4,422,715**

## FIBER OPTIC CONNECTOR HAVING FIBER CUTTING MEANS

**Russell H. Williams, Harrisburg, Pa.; Peter Garner, Flemington, and K. Scott Gordon, Sergeantsville, both of N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.**

**Filed Jun. 22, 1981, Ser. No. 276,055**
**Int. Cl.³ G02B 7/26**
**U.S. Cl. 350—96.20** **33 Claims**

13. A fiber optic connector for termination with a termination device, comprising in combination:
(a) first housing means including separation means thereon;
(b) second housing means for retentively engaging said fiber; and
(c) means coupling said first and said second housing means for movement relative to each other to effect separation of a portion of said fiber during such relative movement of said first and second housing means, a retentively engaged



portion of said separated fiber defining an end face for termination with a termination device.

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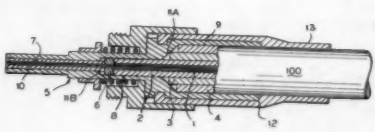
**4,422,716**

## OPTICAL FIBER CONNECTOR

**Yoshitaka Morimoto; Tomiji Shiga, and Akio Ushirogawa, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan**

**Filed Oct. 31, 1980, Ser. No. 202,631**
**Claims priority, application Japan, Nov. 21, 1979, 54-151174**
**Int. Cl.³ G02B 7/26**
**U.S. Cl. 350—96.21** **6 Claims**




1. An optical fiber cable termination assembly for an optical fiber cable comprising:
an optical fiber cable including at least one optical fiber for transmitting a light beam and a protective tubular member for protecting said optical fiber while enabling said optical fiber to move freely and axially therein, a forward part of said optical fiber protruding from the end of said protective tubular member;
a sleeve member abutting against the end of said protective tubular member for fixing a portion of said forward part of said optical fiber therein so that said forward part of said optical fiber does not move into or out of said protective tubular member, an inner diameter of said sleeve member being dimensioned to be substantially equal to the corresponding dimension of said optical fiber;
a glass tube for tightly retaining the remainder of said forward end of said optical fiber; and
termination means having a first bore for receiving said glass tube, a second bore for receiving said sleeve member and a third bore for receiving a protective jacket for said optical fiber including said protective tubular member.

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**4,422,717**

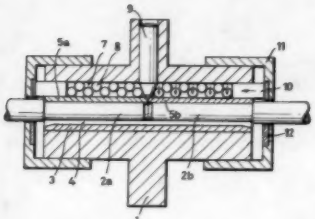
## COUPLING ARRANGEMENT FOR OPTICAL WAVEGUIDES

**Bernhard Schmidt, Neunkirchen, Fed. Rep. of Germany, assignor to Felten & Guilleaume Carlswerk Aktiengesellschaft, Cologne, Fed. Rep. of Germany**

**Filed Jul. 6, 1981, Ser. No. 280,508**
**Claims priority, application Fed. Rep. of Germany, Jul. 9, 1980, 3025888**
**Int. Cl.³ G02B 7/26**
**U.S. Cl. 350—96.21** **7 Claims**

6. An arrangement for coupling optical fiber ends mounted in respective connectors, comprising an elongated hollow housing; clamping means in said housing including a prismatic

first clamping member extending over the entire length of said housing and having a longitudinally extending V-shaped groove, and a pair of identical second clamping members each extending over a part of the length of said first clamping member in registry with said groove to bound therewith a confining space for receiving the respective connector-mounted optical fiber end; a plurality of pressing bodies received between said housing and said second clamping members; means for urging said pressing bodies against said second clamping members with an adjustable force to thereby clamp the respective optical fiber ends received in the respective confining spaces between the respective second clamping members and said first




clamping member, including a pair of end caps each mounted on one end of said housing, and a plurality of urging members respectively interposed between said end caps and said pressing bodies and transmitting force therebetween; and wherein said housing has a unitary longitudinal recess registering with said second clamping members for receiving said pressing bodies; and further comprising means for subdividing said plurality of pressing bodies into two groups each acting on one of said second clamping members independently of the action of the other group on the other second clamping member, including a projection extending into said recess and subdividing the same into two parts.

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**4,422,718**

## SUBMARINE OPTICAL FIBER CABLE

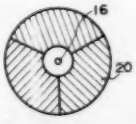
**Yukio Nakagome; Kitsutaro Amano, both of Yokohama; Taichiro Nakai, Fujisawa; Yasuhiko Niiro, Yokohama; Yoshihiro Ejiri, Tokyo; Hitoshi Yamamoto, Kawasaki, and Yoshihiko Yamazaki, Kashiwa, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 20,872, Mar. 15, 1979, abandoned. This application Nov. 3, 1981, Ser. No. 317,842**

**Claims priority, application Japan, Mar. 31, 1978, 53-36580; Mar. 31, 1978, 53-36581**

**Int. Cl.³ G02B 5/14**

**U.S. Cl. 350—96.23** **8 Claims**




1. A submarine optical fiber cable using a low-loss optical fiber as a transmission medium comprising a cylindrical pressure-resisting metal layer consisting of an assembly of only three longitudinally extending nonstranded pressure-resisting segments, each of said segments being fan-shaped in cross section and all equal in cross section with entirely flat contact surfaces along which the segments make contact longitudinally and solid throughout, said segments converging toward a center and defining one cylindrical optical fiber housing space centrally of the assembly, and at least one low-loss optical fiber extending longitudinally in the optical fiber housing space formed in the center of the assembly so the low-loss optical fiber is protected from a high hydrostatic water pressure.

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**4,422,719**

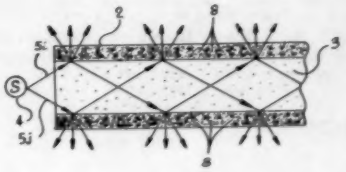
## OPTICAL DISTRIBUTION SYSTEM INCLUDING LIGHT GUIDE

**Donald E. Orcutt, Succasunna, N.J., assignor to Space-Lyte International, Inc., Newark, N.J.**

**Filed May 7, 1981, Ser. No. 261,688**

**Int. Cl.³ G02B 5/14**

**U.S. Cl. 350—96.30** **48 Claims**




1. An optical distribution system comprising in combination:
a source of light;
means to apply light derived from said source to an area requiring illumination;
said means comprising a flexible light guide coupled in light-transmitting relation to said source, said light guide comprising a flexible core of light transmitting material; and
a sleeve of transparent or translucent material tightly surrounding said core in unbonded relationship thereto and in a manner to substantially eliminate air from the interface between said core and said sleeve, said sleeve and said core being constructed and arranged to laterally diffuse, disperse or refract through the sidewall of said sleeve a substantial component of the light traversing said core longitudinally.

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**4,422,720**

## STEREOSCOPIC VIEWING AND PROJECTION SYSTEM

**David M. Sheiman, 1401 Alvarado Ter., Los Angeles, Calif. 90006, and Elliot A. Rudell, 2422 Curtis Ave., Redondo Beach, Calif. 90278**

**Continuation-in-part of Ser. No. 920,280, Jun. 29, 1978, Pat. No. 4,235,515, which is a continuation-in-part of Ser. No. 632,224, Nov. 17, 1975, abandoned. This application Oct. 9, 1980, Ser. No. 195,680**

**The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.**

**Int. Cl.³ G02B 27/14, 27/24**

**U.S. Cl. 350—138** **31 Claims**

1. A stereoscopic viewing system comprising:
(a) a thin plate prism with a plano face and an opposite face bearing a plurality of parallel, spaced-apart, straight-line, V-grooves defining a plurality of straight, spaced-apart, triangular prisms that provide a viewing face;

(b) a mirror to one side of and parallel to said thin plate prism;
(c) a first imaging surface behind said thin plate prism, at an occluded angle of 1 degree to 15 degrees relative to said prism;
(d) a second imaging surface in the reflected line of sight from said mirror, at an occluded angle of 40 to 60 degrees with said mirror; and
(e) first and second stereoscopic images displayed, respectively, on said first and second imaging surfaces.

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## 4,422,721
## OPTICAL ARTICLE HAVING A CONDUCTIVE ANTI-REFLECTION COATING

**Robert E. Hahn; Thomas R. Jones, both of Santa Rosa, and Peter H. Berning, Sebastopol, all of Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.**

**Filed Aug. 9, 1982, Ser. No. 406,302**
**Int. Cl.³ G02B 1/10**
**U.S. Cl. 350—164** **9 Claims**

1. In an optical article, a substrate having first and second surfaces and a conductive antireflection coating disposed on the first surface, said conductive antireflection coating having at least one layer of a low index material carried by said first surface and a thin transparent conducting layer of the material having a high index of refraction carried by said layer of low index material and providing an exposed surface to which a direct electrical contact can be made, said thin transparent conducting layer having an optical thickness ranging from 1.0 to 30.0 nanometers and wherein said layer of low index material has its design thickness reduced to compensate for the thickness of the thin transparent conducting layer whereby the provision of the thin conducting layer does not seriously degrade the optical performance of the coating over that which could be obtained without the use of the thin transparent conducting layer.

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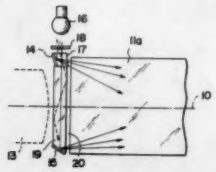
## 4,422,722
## COLOR SEPARATION OPTICAL SYSTEM FOR COLOR TELEVISION CAMERA

**Takeshi Higuchi; Kazuo Yoshikawa, both of Ohmiya, and Hideo Buto, Okegawa, all of Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan**

**Filed Feb. ., 1981, Ser. No. 230,605**
**Claims priority, application Japan, Feb. 22, 1980, 55-21216**
**Int. Cl.³ G02B 27/10; H04N 9/09**
**U.S. Cl. 350—173** **6 Claims**




1. A color separation optical system for a color television camera disposed between a taking lens of a television camera and a plurality of image pick up elements for color components consisting of a number of prism blocks wherein the improvement comprises a plane parallel plate located with an air gap in front of an entrance face of a prism block of the color separation system, and bias light reflecting surfaces provided at a periphery of said plane parallel plate for reflecting bias light toward said entrance face of the prism block, said bias light reflecting surfaces being toric surfaces.

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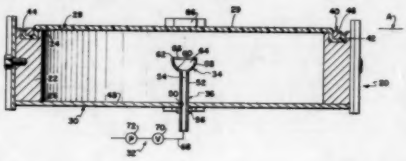
## 4,422,723
## ADJUSTABLE REFLECTOR WITH IMPERFORATE REFLECTIVE MEMBRANE

**Carl L. Williams, Jr.; Robert S. Black, and Larry R. Payne, all of Abilene, Tex., assignors to LaJet Energy Company, Abilene, Tex.**

**Filed Aug. 11, 1981, Ser. No. 291,911**
**Int. Cl.³ G02B 5/10**
**U.S. Cl. 350—295** **26 Claims**



1. A reflector comprising:
a hollow housing having top and bottom openings;
a flexible, elastic imperforate reflective membrane, coupled over said top opening in a gas-tight manner;
base means for covering said bottom opening in a gas-tight manner;
evacuation means, coupled to said housing, for creating a partial vacuum in said housing tending to deflect said membrane below a reference plane and into said housing;
control means for regulating evacuation of said housing by said evacuation means; and
adjustment means, coupled to said base means, for supporting and adjustably positioning said control means in said housing at a location corresponding to a predetermined deflection of said membrane below said reference plane.

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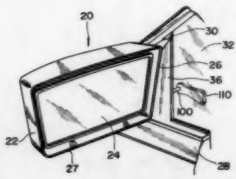
## 4,422,724
## REAR VIEW MIRROR ARRANGEMENT TO BE MOUNTED ON A VEHICLE DOOR

**Hidehiro Otsuka, Tokyo; Takaaki Oda; Fumiyoshi Sato, both of Machida, and Masaaki Kikuta, Sayama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Continuation of Ser. No. 240,196, Mar. 3, 1981, abandoned. This application Apr. 14, 1983, Ser. No. 483,848**
**Claims priority, application Japan, Mar. 5, 1980, 55-26730**
**Int. Cl.³ G02B 7/18; B60R 1/06**
**U.S. Cl. 350—307** **16 Claims**




1. A rear view mirror arrangement for an automotive vehicle, which is mounted on the vehicle side door, comprising:
a reflecting mirror;
a mirror housing having a first pivot means for pivotably supporting said mirror therewithin;
a mirror angle adjustment lever having an operating handle at the inner end thereof, said handle being positioned inside of the vehicle passenger compartment, said lever

having an outer end cooperatively and releasably connected to said mirror, and said lever having a second pivot means provided at the intermediate portion of said adjustment lever for permitting said adjustment lever to move in any direction; and

a spring provided between said mirror housing and the vehicle side door for elastically urging said mirror housing against the vehicle side door in order to retain said mirror housing in the laterally protruded position.

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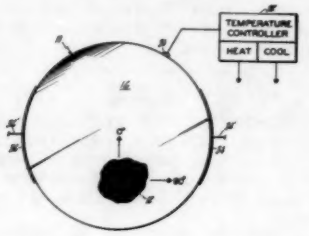
4,422,725

## METHOD OF OPTIMALLY OPERATING A GRAPHITE FIBER REINFORCED GLASS MATRIX COMPOSITE OPTICAL ARTICLE

Karl M. Prewo, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 16, 1981, Ser. No. 243,689
Int. Cl.³ G02B 5/08
U.S. Cl. 350—310 13 Claims




1. For a laser mirror comprising principally a graphite fiber reinforced-glass matrix composite, the thermal strain for said composite over a wide temperature range being a non-linear function of temperature, said function exhibiting a region of minimum absolute slope, the method of minimizing changes in the size of said mirror comprising the step of:

maintaining the temperature of said mirror within a limited range in said wide temperature range, said limited range being substantially at said region of minimum slope of said thermal strain function for said composite.

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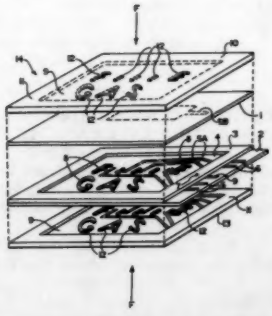
4,422,726

## METHOD OF MAKING AN ELECTRO-OPTICAL DISPLAY

Steven D. Harris, Uniontown, and Joseph I. Wolfe, Stow, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 14, 1981, Ser. No. 311,692
Int. Cl.³ G02F 1/133
U.S. Cl. 350—331 R 9 Claims




1. A method of making an electro-optical display having improved optical uniformity, said display comprising a pair of plates of which at least one plate is transparent, said plates bonded together by means of a seal made from an hermetic sealant composition that encloses a cavity between the plates that contains an electro-optical material whose ability to convey information to a viewer of the display is dependent upon whether the electro-optical material is in an electrically energized or an electrically unenergized state imparted thereto by means of an electrically conductive coating in the form of at least one discrete image disposed on side of the plates facing towards the electro-optical material, said method including the steps of:

(a) providing at least one pressure plate in addition to said pair of plates having at least one raised portion on the surface thereof, said raised portion dimensionally adapted to align with and press uniformly substantially only upon the seal when the pressure plate is positioned and pressed against the side of the optical display plate facing away from the cavity so as to minimize or eliminate refraction patterns that might have otherwise arisen in the electro-optical material in the absence of the uniform pressure provided by the raised portion;

(b) positioning the pressure plate of step (a) on the side of the optical display plate facing away from the cavity; and

(c) pressing the pressure plate of step (b) against the display plate so as to urge both of the display plates together.

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4,422,727

## LACQUER, WITH INORGANIC FILLER, COATING DISPLAY-ELEMENT'S POLARIZER

Holm Baeger, Bad Soden, and Hans Wedel, Mühltal, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Fed. Rep. of Germany

Filed Oct. 16, 1980, Ser. No. 197,687
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1979, 2944325
Int. Cl.³ G02F 1/133
U.S. Cl. 350—334 2 Claims

1. A passive electro-optical indicating element for displaying information such as alphabetical and numerical characters, comprising:

a front transparent electrode support;

a back transparent electrode support, which together with said front transparent electrode support defines a cavity;

a liquid crystal substance enclosed in said cavity formed by said front and back transparent electrode supports;

a polarizer arranged on the surface of each said front and back transparent electrode supports opposite said liquid crystal substance;

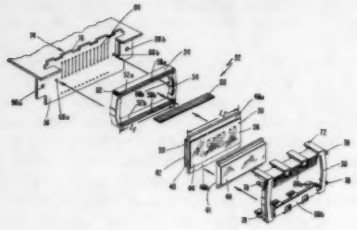
a thin coating of a transparent curable lacquer applied to the outside surface of the polarizer arranged on said front electrode support, said coating of a transparent curable lacquer including an inorganic filler of silicon dioxide suspended therein in an amount between 2 and 10 percent by weight of the prepared lacquer.

**4,422,728**

## LIQUID CRYSTAL MOUNTING AND CONNECTION SCHEME

**Joseph Andreaggi, Short Hills, N.J., assignor to Sangamo Weston, Inc., Atlanta, Ga.**

**Filed Jan. 30, 1981, Ser. No. 230,409**
**Int. Cl.³ G02F 1/133**
**U.S. Cl. 350—334** **7 Claims**



3. A liquid crystal display (LCD) device assembly comprising:

an LCD having electrical conductors for receiving signals;

a circuit board containing a conductive pattern corresponding in position to the electrical conductors of said LCD;

a holder positioned between said LCD and said circuit board, said holder including means for maintaining said LCD in registration with said conductive pattern on said circuit board;

means for establishing electrical connections between said conductive pattern on said circuit board and the corresponding conductors on said LCD;

a cover member positioned around said LCD and said holder, said LCD being exposed through an opening formed in said cover member; and

clip means for releasably retaining said cover member to said circuit board, wherein said LCD holder comprises a circumferential frame having a length between opposite ends of said holder greater than the length of said LCD, one of said ends containing a spring member, said frame forming a seat for receiving said LCD, said spring member being integral with said holder and biased inwardly into contact with said LCD, said LCD being retained within said frame by said spring member.

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**4,422,729**

## ELECTRO-OPTICAL DIAPHRAGM WITH RADIAL ELECTRODES

**Ryoichi Suzuki, Kawasaki, and Takashi Uchiyama, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

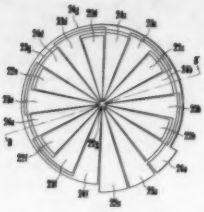
**Filed Jul. 1, 1980, Ser. No. 165,149**
**Claims priority, application Japan, Jul. 4, 1979, 54-84848**
**The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.**
**Int. Cl.³ G02F 1/13, 1/133, 1/03; G03B 9/08**
**U.S. Cl. 350—336** **2 Claims**

2. In a solid state diaphram device for use in a photographic camera having an electro-optical element and a matrix drive system for controlling the selection of light transmitting areas of said electro-optical element to vary the size of the diaphragm aperture, the improvement comprising:

first and second transparent plates sandwiching said electro-optical element;

a first set of transparent annular electrodes positioned on said first transparent plate and arranged in concentric relation to each other, and

a second set of transparent electrodes positioned on said second transparent plate and arranged in radial relation to



each other and having respective areas, each area of second set of transparent electrodes being set in such a manner that the amount of light passing the diaphram aperture vary in accordance with the variation of an intermediate step in APEX system.

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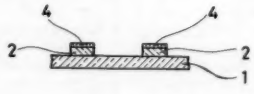
**4,422,730**

## LIQUID CRYSTAL DISPLAY DEVICE AND THE MANUFACTURING METHOD THEREOF

**Shuichi Kozaki, Nara; Fumiaki Funada, Yamatokoriyama; Shigehiro Minezaki, Ikoma, and Hisashi Uede, Wakayama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Oct. 16, 1980, Ser. No. 197,575**
**Claims priority, application Japan, Oct. 18, 1979, 54-134806; Feb. 27, 1980, 55-24403; Feb. 28, 1980, 55-24842**
**Int. Cl.³ G02F 1/133**
**U.S. Cl. 350—339 R** **11 Claims**




1. A method for making a liquid crystal display device comprising the steps of:

providing a pair of substrates;

forming a first patterned layer on a part of one of the substrates;

forming a second layer on the remaining part of one of the substrates, the thickness of the second layer being substantially identical to that of the first patterned layer to provide a uniform layer in thickness;

forming an additional layer on the uniform layer; and disposing a liquid crystal layer between the pair of substrates.

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**4,422,731**

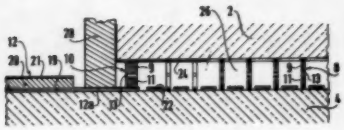
## DISPLAY UNIT WITH HALF-STUD, SPACER, CONNECTION LAYER AND METHOD OF MANUFACTURING

**Jean-Paul Droguet, Courbevoie, and Michel Vernay, Paris, both of France, assignors to Societe Industrielle des Nouvelles Techniques Radioelectriques Societe Anonyme dite, Asnieres, France**

**Filed May 6, 1981, Ser. No. 261,083**
**Claims priority, application France, May 8, 1980, 80 10274**
**Int. Cl.³ G02F 1/13**
**U.S. Cl. 350—344** **7 Claims**

5. A method of manufacturing a two-dimensional display unit said method including the following steps:

depositing electrodes on a transparent front plate and on a back plate;
fixing said plates face to face so as to leave a constant micrometric gap between their facing "inside" surfaces;
depositing a sealing strip which joins said plates together along the edge of an inner zone to form a sealed chamber between said plates, said inner zone containing said electrodes;
filling said chamber with a fluid having an optical characteristic which is electrically controllable; and
connecting said electrodes to control circuits which are suitable for supplying display signals to control said optical characteristic; the improvement wherein said step



during which said plates are fixed face to face itself includes the following steps:
depositing adhesive metal half studs on each of the inner surfaces in such a way that each half stud deposited on one of said plates is in register with a half stud deposited on the other of said plates, at least some of said studs being spacer studs spaced out in said inner zone;
depositing a connection layer on the tops of the half studs of at least one of said plates;
installing said plates with contact between the tops of the half studs which face each other; and
forming connections between the half studs in contact via said connection layer so as to form studs which joins said plates together.

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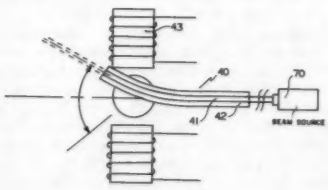
**4,422,732**
**BEAM ADDRESSED ELECTROOPTIC DISPLAY SYSTEM**
**Richard J. Ditzik, 9838C Appletree Dr., San Diego, Calif. 92124**
**Filed Jun. 8, 1981, Ser. No. 271,692**
**Int. Cl.³ G02F 1/03**
**U.S. Cl. 350—356** **7 Claims**



1. A method for manufacturing large area electrooptic displays which comprises:
(a) placing a glass or transparent substrate on a work surface,
(b) fixing spacers around the margins of the substrate,
(c) fixing a first thin membrane to the spacers such that the first membrane is in spaced relationship to the substrate,
(d) injecting an electrooptic material in a space between the first membrane and the substrate,
(e) applying optically clear adhesive to an open surface of the first membrane,
(f) laying a second thin membrane upon the adhesived surface of the first membrane,
(g) from a suitable height above the second membrane, directing a low power laser beam normal to the work surface through an optical diffuser, through a conventional beam-splitter, and on to an exposed surface of the second membrane,
(h) while the adhesive is curing, observing any Fezeau fringes and applying pressure normal to the exposed surface of the second membrane until said fringes disappear,
(i) after the adhesive has set, fixing a protective transparent substrate in spaced relation to the second membrane.

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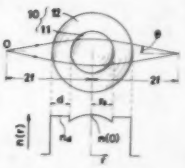
**4,422,733**
**CLADDED SPHERICAL LENS HAVING UNEVEN REFRACTIVE INDEX**
**Keisuke Kikuchi, Ibaragi; Takitaro Morikawa, Sayama; Junichi Shimada, Ibaragi, and Kenjiro Sakurai, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan**
**Filed Mar. 18, 1981, Ser. No. 244,915**
**Claims priority, application Japan, Mar. 31, 1980, 55-42348; Aug. 27, 1980, 55-118126; Sep. 4, 1980, 55-122666**
**Int. Cl.³ G02B 9/02**
**U.S. Cl. 350—413** **5 Claims**



1. A cladded lens having an uneven refractive index, comprising:
(a) a core having a radius ($r_o$) and a refractive index (n(r)) continuously graded in proportion to the distance (r) from the center thereof according to the formula:

$$n^2(r)=n^2(o)[1+G_2(r/r_o)^2+G_4(r/r_o)^4]$$

where n(o) is the refractive index at the center of the core, and $G_2$ and $G_4$ the secondary- and fourth-order coefficients representing the distribution of the graded refractive index of the core; and
(b) a cladding covering at least a portion of the outer periphery of said core and having a thickness and a refractive index which are determined in accordance with the refractive index at the center of said core, whereby the aberration can be reduced below the diffraction limit of light.

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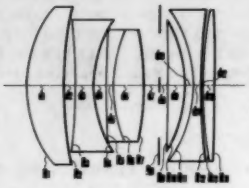
**4,422,734**
**PHOTOGRAPHIC LENS SYSTEM HAVING AN AUXILIARY LENS**
**Kazuo Tanaka, Tokyo, and Keiji Ikemori, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha**
**Filed Dec. 24, 1980, Ser. No. 219,977**
**Claims priority, application Japan, Dec. 28, 1979, 54-171341**
**Int. Cl.³ G02B 9/62, 9/64, 15/10**
**U.S. Cl. 350—422** **8 Claims**

1. A photographic lens system comprising:
a principal lens having an optical axis; and
an auxiliary lens to be mounted at the image side of the principal lens in such a manner that the optical axis coincide with each other, said lens being capable of being dismounted, having a negative refractive power and consisting of the first positive lens, the second negative lens

and the third positive lens in sequence from the object side; and wherein the compound refractive power of the



second negative lens and the third positive lens is negative.

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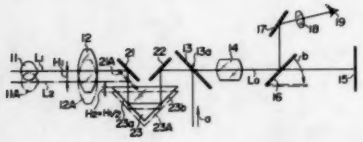
**4,422,735**

**FUNDUS CAMERA**

**Tsutomu Shimizu, Hanno; Koji Inaba, and Naomiki Araki, both of Hachioji, all of Japan, assignors to Olympus Optical Company, Ltd., Japan**

**Filed Jan. 29, 1981, Ser. No. 229,463**
**Claims priority, application Japan, Apr. 22, 1980, 55-52385**
**Int. Cl.³ A61B *3/14***
**U.S. Cl. 351—206** **8 Claims**



1. A fundus camera, comprising:

an objective lens having a principal optical axis;

said objective lens being disposed to be movable in a plane which is perpendicular to said principal optical axis thereof to align said principal optical axis thereof with a visual axis of an eye being examined;

a first reflecting surface disposed on the principal optical axis of said objective lens for movement simultaneously with and in the same direction and through the same distance as said objective lens;

a second reflecting surface disposed for movement simultaneously with and in the same direction as and through one-half the distance travelled by said objective lens; said first reflecting surface reflecting light passing through said objective lens to said second reflecting surface;

a third reflecting surface disposed for simultaneous movement with, and in the same direction as, said second reflecting surface and moving the same distance as said second reflecting surface, said second reflecting surface reflecting light reflected by said first reflecting surface to said third reflecting surface;

a stationary fourth reflecting surface; said third reflecting surface reflecting light that has been reflected by said second reflecting surface to said fourth reflecting surface; and

an apertured reflecting mirror disposed for reflecting illuminating light in a direction which will cause said illuminating light to be reflected by said fourth, third, second and first reflecting surfaces and through said objective lens to illuminate the fundus oculi of an eye being examined and which will also permit light reflected off the fundus oculi of the eye, and then passing through said objective lens and reflected off said first through fourth reflective surfaces, to pass through the aperture of said reflecting mirror so as to permit observation or photographing of the illuminated fundus oculi through said objective lens and through said aperture of said apertured mirror.

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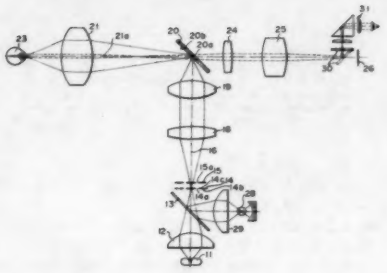
**4,422,736**

**EYE FUNDUS CAMERA HAVING RING SLIT MASK IN ILLUMINATING SYSTEM**

**Kazuo Nunokawa, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 18, 1981, Ser. No. 245,149**
**Claims priority, application Japan, Mar. 21, 1980, 55-36769**
**Int. Cl.³ A61B *3/14, 3/10*; G03B *7/00***
**U.S. Cl. 351—207** **4 Claims**



1. An eye fundus camera comprising objective lens means adapted to be placed opposite to a patient's eye with a distance between the objective lens means and the patient's eye, an illumination optical system for projecting an illumination light beam through said objective lens means, and an observing optical system for directing a light beam reflected from said patient's eye through said objective lens means to an image plane, said illuminating system including a first ring-shaped aperture located substantially in conjugate with the cornea of the patient's eye and a second ring-shaped aperture located substantially in conjugate with the iris of the eye, said first ring-shaped aperture having a ring-shaped dimming band therein.

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**4,422,737**

**DEVICE FOR OBTAINING TOPOGRAPHIC PICTURE OF SURFACE OF ROTATING OBJECT**

**Dmitry D. Gribanov, ulitsa Chusovskaya, 11, korpus 6, kv. 35, Moscow; Vladimir P. Kulesh, ulitsa Stroitelnaya, 6, kv. 29, Zhukovsky, Moskovskaya oblast; Apollinary K. Martynov, 3 Frunzenskaya ulitsa, 3, kv. 40, Moscow; Anatoly A. Orlov, ulitsa Naberezhnaya Tsialkovskogo, 22, kv. 82, Zhukovsky, Moskovskaya oblast; Alexandr I. Sidorov, poselok Tomilino, ulitsa Gogolya, 24, kv. 73, Moskovskaya oblast, Ljuberetsky raion; Sergei D. Fonov, poselok Zarya, 180, kv. 52, Moskovskaya oblast, Balashikhinsky raion, and Arkady V. Stepanov, ulitsa Serova, 18, kv. 22, Zhukovsky, Moskovskaya oblast, all of U.S.S.R.**

**Filed Dec. 14, 1981, Ser. No. 330,702**
**Int. Cl.³ G03B *19/18, 21/32***
**U.S. Cl. 352—39** **14 Claims**

1. A device for obtaining a topographic picture of the surface of a rotating object, comprising:

a turret assembly whose axis of rotation coincides with the axis of rotation of said rotating object;

a pulsed laser installed on said turret assembly coaxially with its axis of rotation;

an optical system forming a set of light planes from a light beam coming from said pulsed laser;

a reflector arranged on the axis of rotation of said rotating object and directing said light planes at the surface of the rotation object;

a photorecorder installed on said turret assembly and having its

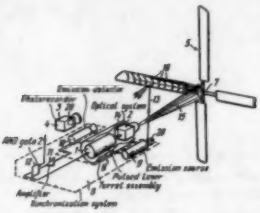
recording plane optically mated with said rotating object, said photorecorder being used to record intersection of said light planes with the rotating object;

a system designed to synchronize an instant at which said pulsed laser emits as said rotating object passes preset points on its path, including:

an emission source installed on said rotating turret, the emission source being directed at a present point along the path of the rotating object, and

a detector receiving radiation from said source, recording it as said rotating object passes present points along its path and furnishing a signal enabling synchronous emission of said pulsed laser; and

a unit controlling position of said turret assembly, including:



a sensor indicating present position of said turret assembly, and

a sensor indicating the preset position of said turret assembly; and

a circuit designed to compare the present position of the turret assembly with the preset position thereof, said comparison circuit having three inputs and an output, said first input being connected to said sensor indicating the present position of the turret assembly, the second input being connected to said sensor indicating the preset position of said turret assembly, while the third input is connected to said emission detector, the output of said comparison circuit being connected to said pulsed laser to enable its operation at the instant aa signal is applied from said emission detector.

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**4,422,738**

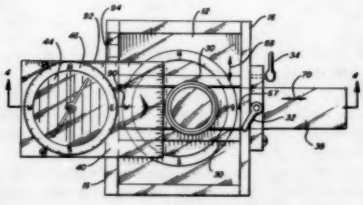
## HAND-HELD MAP VIEWER AND NAVIGATIONAL AID

**Daniel W. Steele, 2 Sherwood Cir., Clay, N.Y. 13041**

**Continuation-in-part of Ser. No. 41,648, May 23, 1979, abandoned. This application Jan. 28, 1981, Ser. No. 229,232**

**Int. Cl.³ G03B *21/00***

**U.S. Cl. 353—11** **19 Claims**



1. A self-contained map viewer and navigational aid unit comprising:

(a) a base member having a circular opening therein;

(b) a map holder with a map supported therein;

(c) means for releasably attaching said map holder to said base for rotation about a predetermined axis with said map positioned within said opening;

(d) viewing means through which a portion of said map is visible;

(e) movable means upon which said viewing means is carried, said movable means being mounted for movement relative to said base linearly in any direction in a plane adjacent and parallel to said map to selectively change said visible portion; and

(f) means selectively movable into and out of contact with a portion of said map holder to make a visible trace thereon when in contact therewith in response to relative movement of said viewing means and said map holder.

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**4,422,739**

## AUTO FOCUS CAMERA

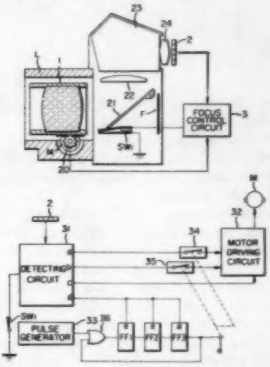
**Sakuji Watanabe, Warabi; Akira Ogasawara, Yokohama; Nobuhiko Terui, Tokyo; Kunihisa Hoshino, Kawasaki, and Ken Utagawa, Yokohama, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Aug. 25, 1981, Ser. No. 296,143**

**Claims priority, application Japan, Aug. 30, 1980, 55-120217**

**Int. Cl.³ G03B *13/20, 7/08***

**U.S. Cl. 354—404** **5 Claims**




1. In a single lens reflex camera which comprises a movable reflecting mirror disposed across a phototaking optical path, the mirror being retracted from the phototaking optical path prior to exposure to the film; automatic focusing means having detecting means detecting the focusing state of a phototaking lens from the output of a light receiving means disposed on a substantial focusing plane of a light beam passed through the movable reflecting mirror and generating selectively an in-focus signal and an out-of-focus signal, and driving means which displaces the phototaking lens in response to the out-of-focus signal and stops displacing the phototaking lens in response to the in-focus signal; and first disabling means for disabling the automatic focusing means in response to retraction of the movable mirror from the phototaking optical path, the improvement comprising:

second disabling means for disabling the driving means during generation of the in-focus signal in response thereto to thereby restrain movement of the phototaking lens, the second disabling means including timer means which starts counting when generation of the in-focus signal has stopped and counts a predetermined time interval at least until completion of disabling of the automatic focus means by the first disabling means, the second disabling means maintaining the disabled condition of the driving means until the timer completes counting.

**4,422,740**

## LENS ASSEMBLY PROVIDED WITH AN AUTOMATIC FOCUSING DEVICE

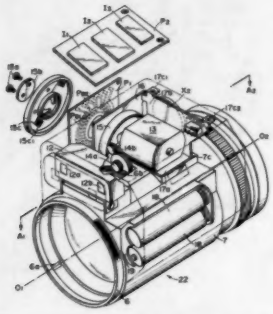
**Tohru Kawai, Kawasaki, both of Japan, and Akiyasu Sumi, Yokohama, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 6, 1981, Ser. No. 280,549**

**Claims priority, application Japan, Jul. 7, 1980, 55/92883; Jul. 9, 1980, 55/96744[U]; Jul. 9, 1980, 55/96745[U]; Jul. 9, 1980, 55/96746[U]; Aug. 7, 1980, 55/111984[U]; Jan. 9, 1981, 56/1495[U]**

**Int. Cl.³ G03B *3/10***

**U.S. Cl. 354—25** **2 Claims**



1. An interchangeable lens assembly provided with an automatic focusing device, comprising:

(a) a phototaking lens system for imaging an object;

(b) a first fixed barrel for holding said phototaking lens system for movement in a direction along its optical axis;

(c) a second fixed barrel;

(d) an automatic focusing device including a distance detector mounted on said second fixed barrel for detecting the object distance and for producing a drive force for automatically moving said phototaking lens system to an in-focus position, wherein when said lens assembly is mounted to a camera body said distance detector is disposed on the upper half of said lens body and is inclined with respect to the base of the camera body;

(e) a focus adjusting member for moving said phototaking lens system, said focus adjusting member and said automatic focusing device being connected to each other through an aperture formed in a portion of said second fixed barrel, said phototaking lens system being moved in accordance with the drive force from said automatic focusing device; and

(f) cover means for covering at least a portion of said automatic focusing device, said second fixed barrel covering the portion of said lens assembly which is not covered by said cover means.

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**4,422,741**

## DISTANCE DETECTING DEVICE AND A FOCUS CONTROL SYSTEM UTILIZING THE SAME

**Makoto Masunaga; Takao Kinoshita, both of Tokyo; Toshio Sakane; Tokuichi Tsunekawa, both of Yokohama; Kazuya Hosoe, Machida; Takashi Amikura, Tokyo, and Isao Harigaya, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 121,690, Feb. 15, 1980, Pat. No. 4,329,033. This application Jan. 29, 1982, Ser. No. 343,987**

**Claims priority, application Japan, Feb. 28, 1979, 54-22906**

**Int. Cl.³ G03B *3/10*; G01C *3/08***

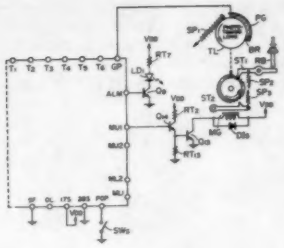
**U.S. Cl. 354—403** **15 Claims**

14. A system for automatically focusing an objective lens means (e.g., TL in FIG. 37) on an object, comprising:

(A) means (e.g., RB, ST1, SP1 in FIG. 37) for moving said lens means from a predetermined position on an optical axis thereof along the axis;

(B) means (e.g., PG, BR in FIGS. 37 and 38) for producing electrical pulses in association with the movement of said lens means;

(C) means (e.g., digital circuit system shown in FIGS. 9A to 9D) for detecting distance to said object and for controlling the stop position of said lens means on the basis of distance data and said electrical pulses produced from said pulse producing means; and



(D) means (e.g., 70 in FIG. 9C) responsive to a first electrical pulse produced from said pulse producing means to change operation mode of said distance detection and stop position control means from distance detection operation to stop position control operation.

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**4,422,742**

## PHOTOGRAPHING MODE SWITCHING DEVICE FOR A CAMERA

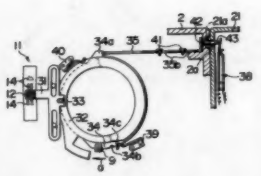
**Fujio Enomoto, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan**

**Filed May 7, 1982, Ser. No. 375,740**

**Claims priority, application Japan, Jul. 27, 1981, 56-112015[U]**

**Int. Cl.³ G03B *7/083, 15/05***

**U.S. Cl. 354—413** **8 Claims**



1. A photographing mode switching device for use in a camera of the type which is adapted to cooperate with an electronic flash which may be detachably mounted thereon to permit a selective switching between an EE photographing mode under natural light and a flash photographing mode; the device comprising:

a mode switching member which normally establishes an EE photographing mode in the camera and which switches the operating mode of the camera to a flash photographing mode in response to an external operation;

a position detecting member for detecting the displacement of the mode switching member to a position in which it establishes the flash photographing mode;

a mounting detecting member for detecting the fact that an electronic flash has been mounted on the camera;

and an electrical shutter control circuit for presetting an exposure period to be used during a flash photography

only when said both detecting members have detected the position and the mounting, respectively.

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**4,422,743**

**EXPOSURE SYSTEM FOR A CAMERA**

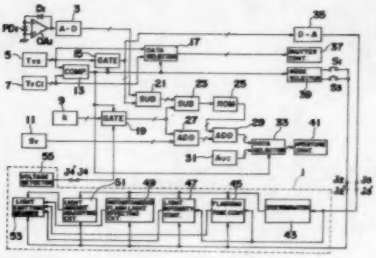
**Tatsuro Izumi; Nobuyuki Taniguchi, both of Sakai; Toshiaki Matsumoto, Izumisano; Masatake Niwa, Sakai; Tokuji Ishida, Daito, and Masatoshi Itoh, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Mar. 19, 1981, Ser. No. 245,688**

**Claims priority, application Japan, Mar. 19, 1980, 55-35540**

**Int. Cl.³ G03B** *15/05*

**U.S. Cl. 354—415** **33 Claims**



**18.** A photographic system for flash photography with a camera comprising:

means for projecting an artificial flash light durable with a controllable intensity for a period of time, so as to illuminate an object to be photographed upon real exposure;

means for receiving light reflected from said object throughout said period of time; and

means for controlling the intensity of said projected artificial light in response to said receiving means.

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**4,422,744**

**APPARATUS FOR SIGNAL TRANSMISSION AND RECEPTION BETWEEN CAMERA AND ATTACHMENT**

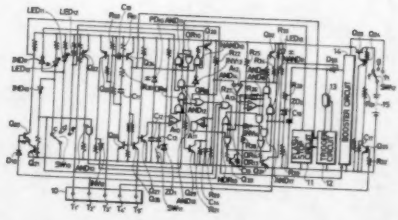
**Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Mar. 16, 1982, Ser. No. 358,838**

**Claims priority, application Japan, Mar. 23, 1981, 56-40499; Mar. 23, 1981, 56-40504**

**Int. Cl.³ G03B** *15/05, 17/00;* **G08B** *1/08;* **G08C** *19/00*

**U.S. Cl. 354—413** **19 Claims**



**1.** An attachment unit attachable to a camera unit including a camera unit terminal, current signal generating means for generating a signal in a form of current and a voltage detection circuit, said attachment unit comprising;

an attachment unit terminal adapted for connection to said camera unit terminal,

voltage signal generating means for generating on said attachment unit terminal a signal in a form of voltage, which is in turn detected by said voltage detection circuit, even when said current signal generating means is generating the current signal, and

a current detection circuit for detecting said current signal on said attachment unit terminal.

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**4,422,745**

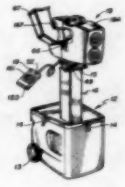
**CAMERA SYSTEM**

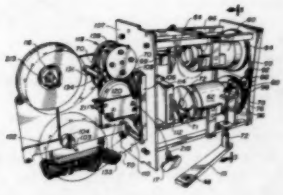
**Talmadge W. Hopson, Bloomington, Minn., assignor to National School Studios, Inc., Minneapolis, Minn.**

**Filed Jul. 31, 1981, Ser. No. 288,815**

**Int. Cl.³ G03B** *17/24*

**U.S. Cl. 354—105** **20 Claims**





**1.** A camera system comprising:

(a) a camera body;

(b) a film supply cartridge loaded with a supply of film and mounted within said camera body;

(c) a film take-up cartridge mounted within said camera body constructed and arranged for receiving film from said film supply cartridge;

(d) lens means mounted on said camera body for projecting an image from outside of said camera body on an exposure location within said camera body;

(e) lens adjusting means for adjusting the magnification of said lens means;

(f) shutter means mounted within said camera body constructed and arranged to permit said lens means to project an image on said exposure location only when said shutter means is opened;

(g) film drive means for moving film from said film supply cartridge through said exposure location to said film take-up cartridge;

(h) actuator means; and

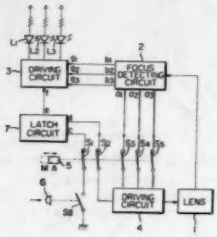
(i) control means for coordinating operation of said film drive means and said shutter means to sequentially expose said film on a frame-by-frame basis in response to said actuator means and for verifying that unexposed film is in said exposure location prior to opening said shutter means.

4,422,746

## AUTO FOCUS CAMERA

Hiroshi Meguro, Kawasaki, and Nobuo Okabe, Narita Higashi, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 4, 1981, Ser. No. 299,788
Claims priority, application Japan, Sep. 11, 1980, 55-129675[U]
Int. Cl.³ G03B 13/18
U.S. Cl. 354—195.12 6 Claims




1. A photographic camera comprising:
(a) a phototaking lens having a focusing lens system controlled to focus on a focal plane an image of an object to be photographed;
(b) means for detecting the focusing state of said image on said focal plane and producing a detecting signal representing the focusing state;
(c) means for displaying the focusing state in response to the detecting signal;
(d) first operating means provided in said phototaking lens and manually operable to control the focusing lens system;
(e) second operating means having electric driving means responding to the detecting signal and electrically operable to control said focusing lens;
(f) first restraining means operable to disable response of the display means and the electric driving means to said detecting signal; and
(g) second restraining means operable to disable response of the electric driving means to said detecting means, the second restraining means having means for disabling operation of the first restraining means during operation of the second restraining means.

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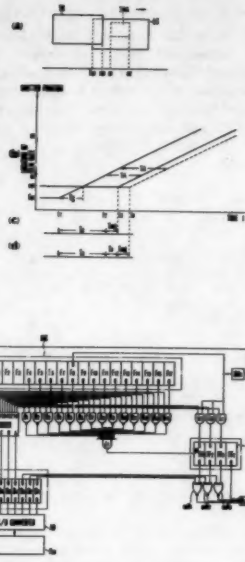
4,422,747

## EXPOSURE TIME CONTROL DEVICE FOR CAMERA

Masanori Uchidoi, Yokohama, and Kazunobu Urushihara, Inagi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 144,981, Apr. 30, 1980, Pat. No. 4,349,263. This application Dec. 16, 1981, Ser. No. 331,198
Claims priority, application Japan, May 8, 1979, 54-56538
The portion of the term of this patent subsequent to Sep. 14, 1999, has been disclaimed.
Int. Cl.³ G03B 9/62
U.S. Cl. 354—458 9 Claims

1. An electrical exposure time control device for a camera having a slit shutter controlled by an electromagnet, comprising:
(a) first timing means for forming a given time interval equal to a desired exposure time but forming an exposure time in the shutter different from the desired exposure time;
(b) second timing means for forming a compensation time interval;
(c) means for maintaining the opening of said shutter for a total time equal to the sum of the given time interval and the compensation time interval so that the shutter is opened for the desired exposure time; and
(d) control means for shortening the given time interval formed by the first timing means by a predetermined time



interval so that the given time interval formed is shorter than the desired exposure time.

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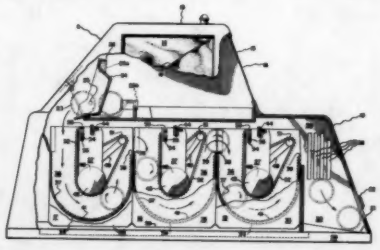
4,422,748

## APPARATUS FOR TRANSPORTING AND PROCESSING PHOTOGRAPHIC MATERIALS OR THE LIKE

Montague Everett, Greenwich, Conn., and Joseph Charipar, Thousand Oaks, Calif., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 15, 1981, Ser. No. 273,548
Int. Cl.³ G03D 3/08
U.S. Cl. 354—316 40 Claims



1. Apparatus for ejecting a small-diameter cylindrical object from a larger-diameter, substantially semicylindrical, horizontal open-topped trough having a horizontal lip, the axis of the object being approximately parallel to the lip, comprising:
toothed belt means for pressing the object against an inner surface of the trough and rotating the object about its axis and
means which constrain the object to roll, without slipping along the inner surface of the trough.

4,422,749

## DEVELOPING APPARATUS

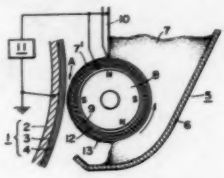
Osamu Hoshino, Tokyo; Michio Ito, Hachiohji, and Akihiko Takeuchi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1981, Ser. No. 308,083

Claims priority, application Japan, Oct. 11, 1980, 55-142205; Oct. 11, 1980, 55-142206

Int. Cl.³ G03G 15/09

U.S. Cl. 355—3 DD 28 Claims



1. A developing apparatus for supplying developer to an electrostatic latent image on an electrostatic latent image bearing member for developing the latent image, comprising:

developer conveying means with developer on a surface thereof for conveying the developer to a developing region, said developer conveying means including a high resistance layer on a developer conveying surface thereof and a medium resistance layer formed thereover and having a volume resistivity of $10^8$ to $10^{12}$ Ωcm;

means for supplying the developer to said developer conveying means; and

means for applying a developing bias voltage to said developer conveying means.

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4,422,750

## DEVELOPER REPLENISHING DEVICE

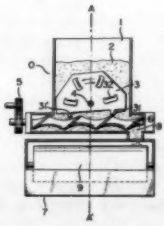
Shun Kawata, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1982, Ser. No. 355,463

Claims priority, application Japan, Mar. 25, 1981, 56-42455[U]

Int. Cl.³ G03G 15/08

U.S. Cl. 355—3 DD 7 Claims



1. In an image recording apparatus of the type in which means are provided to feed toner from a hopper to an image developing unit, the improvement comprising a plate pivotally mounted within said hopper, and means actuated by said feeding means for oscillating said plate, whereby the oscillating of said plate breaks up clumps of toner which may form within said hopper and coking of the toner is prevented.

4,422,751

## ORIGINAL FEED CONTROL UNIT

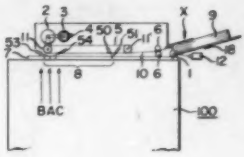
Yutaka Komiya, and Koichi Takada, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1982, Ser. No. 366,576

Claims priority, application Japan, Apr. 15, 1981, 56/55524; Apr. 16, 1981, 56/56214; Apr. 20, 1981, 56/58586

Int. Cl.³ G03G 15/00

U.S. Cl. 355—14 SH 11 Claims



1. An original feed control unit comprising:

comveying means for conveying an original to an exposure station of an image forming apparatus;

input means for entering a desired width of a margin to be formed on a recording material, the width variable; and

control means for controlling a stop position of said original conveyed by said conveying means in accordance with an image forming mode of said image forming apparatus to provide the width of the margin entered from said input means.

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4,422,752

## METHOD OF AND AN APPARATUS FOR CLASSIFYING COLOR FILMS

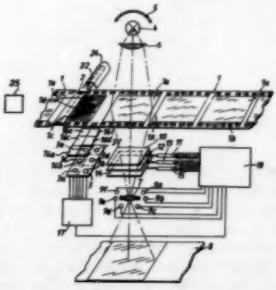
Siegfried Thurm, Voiswinkel, and Konrad Bunge, Cologne, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 10, 1980, Ser. No. 129,108

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1979, 2909336

Int. Cl.³ G03B 27/52

U.S. Cl. 355—41 19 Claims

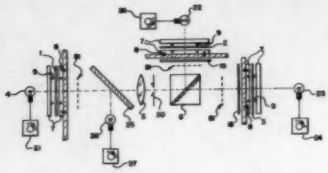


1. A method of classifying a color film, particularly for use in adjusting the exposure of said film during the production of copies therefrom, comprising the steps of providing a marking of predetermined color composition on an unexposed zone of said film by exposing said zone to radiation prior to development and subsequently developing the latter; determining the spectral transmissivity of said marking; and comparing said transmissivity with reference transmissivities.

## 4,422,753
## MULTICHANNEL MASKING CAMERA AND PROJECTOR

Paul L. Pryor, 10 Lonsdale Ave., Dayton, Ohio 45419

Filed Nov. 25, 1981, Ser. No. 324,999
Int. Cl.³ G03B 27/52, 27/70
U.S. Cl. 355—43 3 Claims

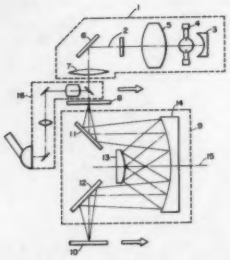


1. A camera-projector comprising: means for producing multiple images of an original scene; means for recording at least one of the images produced; means for insuring that the produced and recorded images are in register one with the other and the original scene; means for illuminating the recorded images for projection in register back through the camera onto the original scene; means for controlling the optical properties of the projected images; said recording means including film holding means for holding film in a precise position; and positioning means for positioning shields on opposite sides of said film holding means.

## 4,422,754
## PROJECTION-PRINTING APPARATUS

Junji Isohata, Tokyo, and Hironori Yamamoto, Chigasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 20, 1982, Ser. No. 340,843
Claims priority, application Japan, Aug. 8, 1981, 56-124212
Int. Cl.³ G03B 27/52, 27/70
U.S. Cl. 355—43 2 Claims



1. A projection-printing apparatus for printing the image of a mask on a wafer, said apparatus comprising:

an imaging optical system for projecting the image of the mask upon the wafer;

means for moving at least one of the mask and the wafer relative to said imaging optical system in a plane perpendicular to the optical axis of said imaging optical system, said moving means including a guide member, a sliding member for carrying at least one of the mask and the wafer and being movable relative to said guide member, and at least one floating element provided on said sliding member for floatingly mounting said sliding member on said guide member for said relative movement;

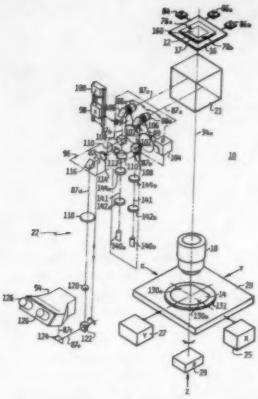
means for detecting irregularities in said guide member; and

means for individually controlling the floating forces of each said floating element to compensate for irregularities in said guide member detected by said detecting means.

## 4,422,755
## FRONTAL ILLUMINATION SYSTEM FOR SEMICONDUCTIVE WAFERS

Edward H. Phillips, Middletown, Calif., assignor to Optimetrix Corporation, Mountain View, Calif.

Continuation of Ser. No. 113,375, Jan. 18, 1980, abandoned. This application Jun. 14, 1982, Ser. No. 388,147
Int. Cl.³ G03B 27/52, 27/70
U.S. Cl. 355—43 19 Claims



1. An optical system for illuminating a workpiece on which a pattern of a masking element is to be photometrically printed and for viewing an image of the illuminated workpiece, said system comprising:

a first holder for holding the workpiece;

a second holder for holding the masking element;

refractive imaging means, disposed between the first and second holders, for projecting an image of the pattern of the masking element onto the workpiece and for projecting an image of an illuminated portion of the workpiece towards the second holder;

first optical means, disposed between the refractive imaging means and the second holder, for providing a viewing port to facilitate viewing of the image of the illuminated portion of the workpiece;

an objective lens unit including at least one objective lens, disposed adjacent to the viewing port, for viewing at least a portion of the image of the illuminated portion of the workpiece;

light source means for providing a beam of illuminating light; and

second optical means, disposed between the light source means and the objective lens and operable with the objective lens, for projecting an image of the light source means to an entrance pupil of the refractive imaging means without passing through the masking element.

## 4,422,756
## COPYING MACHINE

Shunichi Abe, and Mitsuo Akiyama, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1981, Ser. No. 286,196
Claims priority, application Japan, Aug. 20, 1980, 55-113479
Int. Cl.³ G03B 27/34
U.S. Cl. 355—57 6 Claims

1. In a variable magnification copying machine which includes means for operator selection of a predetermined magnification ratio, a path along which copy sheets for receiving and retaining a predeterminately magnified copy of the original are operatively transported, and bidirectionally movable means

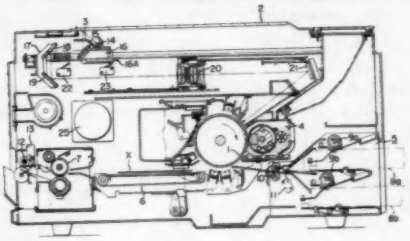
for scanning an original to be copied and movable between an initial position and a limit position,

forward clutch means engageable with said scanning means to cause movement of the scanning means in a first direction from its initial position for scanning of the original to be copied;

return clutch means engageable with said scanning means to cause movement thereof in a second direction opposite said first direction of scanning means movement to return the scanning means to its initial position;

means in the sheet path for detecting the trailing edge of a sheet transported along the path, said detecting means being connected to said forward clutch means to disengage the same from said scanning means, and being further connected to said return clutch means to engage the same with said scanning means, both upon detection of the trailing edge of a sheet transported along the path; and

means connected to the operator selection means and presettable in accordance with the predetermined magnification ratio for causing disengagement of said forward clutch



means from the scanning means when the scanning means in moving in said first direction reaches a position of maximum forward travel preset in accordance with the predetermined magnification ratio selected by an operator;

such that when a copy sheet larger than that normally utilized for receiving a copy of the original at an operator selected magnification ratio is transported along the sheet path, forward movement of the scanning means in said first direction from its initial position is stopped by said presettable means prior to detection of the trailing edge of the sheet to thereby facilitate production of a copy of an original on a sheet larger than necessary to accomodate the copy, said presettable means causing forward movement of the scanning means to stop at a particular preset position dependent upon the magnification ratio selected by an operator, and return movement of the scanning means in said second direction being thereafter initiated by engagement of said reverse clutch means upon subsequent detection of the trailing edge of the copy sheet.

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**4,422,757**

## APPARATUS AND METHOD FOR OPTICAL PHASING OF HELICOPTER MAIN ROTOR BLADES

**Michael S. Munski, Carlsbad, Calif., assignor to Hughes Helicopters, Inc., Culver City, Calif.**

**Filed Aug. 13, 1981, Ser. No. 292,699**
**Int. Cl.³ G01B *11/26***
**U.S. Cl. 356—138** **21 Claims**

1. An apparatus for adjusting lead-lag angles of a plurality of blades of a helicopter rotor system having a rotor blade, hinge pin and rotor hub comprising:

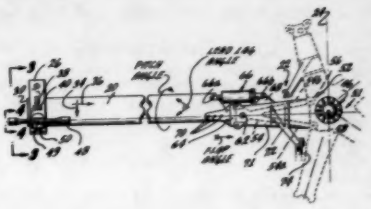
a fitted frame member coupled to the tip of said rotor blade;

frame alignment means coupled to said frame member for spatially positioning said tip of said blade with respect to said rotor hub in a predetermined relation;

a first target arranged and configured to be disposed on said hinge pin;

a second target arranged and configured to be disposed on said rotor hub; and

optical alignment means coupled to said frame for aligning said



tip of said rotor blade, said first target and said second target along a predetermined line,

whereby appropriate lead-lag angles of said rotor blade may be quickly and accurately achieved by a static test.

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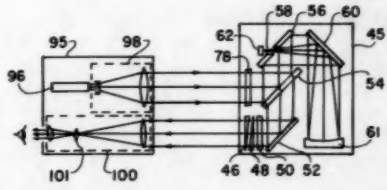
**4,422,758**

## BORESIGHTING OF AIRBORNE LASER DESIGNATION SYSTEMS

**Thomas E. Godfrey, Orange, and Lovere A. Moesser, Diamond Bar, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Jul. 24, 1981, Ser. No. 286,415**
**Int. Cl.³ G01B *11/26*; G01C *1/00***
**U.S. Cl. 356—152** **2 Claims**




1. In the apparatus for boresighting laser designator/ranger devices wherein radiation from a phosphorescent refractory target is collimated and projected by boresight optics for precision alignment of the laser designator device, the improvement eliminating long-term boresighting errors due to changes in mechanical and electrical boresight components comprising:

a boresight module having

a germanium laser IR window,

a visual alignment window,

optical paths leading from each window for focusing and aligning,

an internal refractory target capable of generating visible radiation in response to laser energy;

a plurality of adjustable prism wedge windows for aligning the boresight module optical paths to said visible radiation;

a collimator unit containing

a glass reticle capable of being removed,

a fold mirror,

a parabolic mirror, and

an autocollimating mirror,

each adapted to direct light in a path from the fold mirror, to the parabolic mirror, to the autocollimating mirror and back, and the glass reticle adapted to produce both a visual image and a reflected image;

means positioning said glass reticle in the collimator infinity focal plane by coincident focusing of these two images;

means for securing a phosphorescent ceramic target in said focal plane within the collimator in lieu of the glass reticle;

means within the collimator for exciting said ceramic target to phosphorescence;

an alignment fixture containing a laser beam source and a visual alignment telescope, capable of being set parallel to each other;

means for selecting the autocollimating mirror of the collimator unit with said alignment fixture;

means for focusing the alignment fixture on the collimator phosphorescent ceramic target and for concomitantly aligning the lines of sight of the visual alignment telescope thereon to obtain parallelism between the laser beam and the alignment telescope lines of sight within alignment fixture;

means in front of the parallelized alignment fixture for replacing the collimator with the boresight;

means for axially adjusting the target and for rotating the prism optical wedges within the boresight to align all optical systems of the boresight directly to the alignment fixture laser beam; and

means for locking the optical wedges to set the focus and alignment of the boresight module so that the module is ready for boresighting the laser designator/ranger device.

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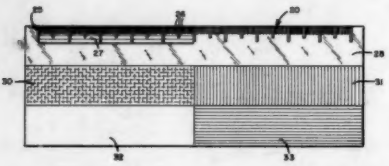
**4,422,759**

## PHOTOGRAPHIC ACCESSORY

**Daniel G. Holman, 12743 Radisson Rd. NE., Blaine, Minn. 55434, and Robert A. Ersek, 2300 Cypress Point West, Austin, Tex. 78746**

**Filed May 4, 1981, Ser. No. 260,078**
**Int. Cl.³ G01J *1/02***
**U.S. Cl. 356—243** **3 Claims**



1. A photographic accessory for scientific and medical use comprising, in combination:

a sheet of flexible, colorless, translucent material having a front surface with a dull finish and at least one linear edge having a scale of photographically perceptible graduations along said edge;

a pressure-sensitive adhesive on the rear surface of said sheet;

a plurality of opaque patches of primary Printing Manufacturing Standards colors on the front surface of said sheet;

so that when said sheet is adhered to a body surface at an area to be treated and photographed, observation of the patches in the resultant photograh enables determination of the color of the area, regardless of color deviations introduced by photographic processes.

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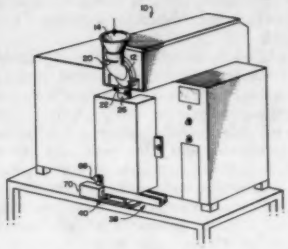
**4,422,760**

## OPTICAL ANALYZING INSTRUMENT HAVING VIBRATING TROUGH

**Donald R. Webster, Laurel, Md., assignor to Pacific Scientific Instruments Company, Anaheim, Calif.**

**Filed Feb. 20, 1981, Ser. No. 236,580**
**Int. Cl.³ G01N *21/01, 21/55***
**U.S. Cl. 356—244** **7 Claims**

1. An analyzing instrument for analyzing samples of particulate material comprising a chute for receiving the samples of particulate material, the chute having a window therein, means positioned at the bottom of the chute for supporting a column of particulate material in the chute, for vibrating the column of particulate material to maintain the material in a freely flowing condition and for removing the particulate material from the



chute, and measuring means for making optical measurements on the sample in the chute through said window as the particulate material moves past the window.

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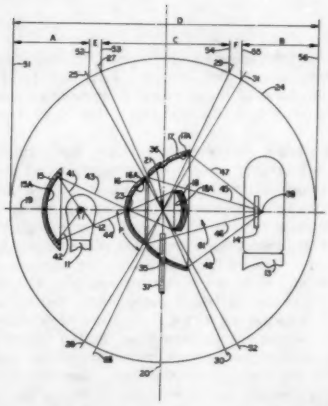
**4,422,761**

## PHOTO-ELECTRIC PARTICLE SENSING SYSTEM

**Joseph C. Frommer, 1525 Teakwood Ave., Cincinnati, Ohio 45224**

**Filed Sep. 28, 1981, Ser. No. 305,974**
**Int. Cl.³ G01N *21/47***
**U.S. Cl. 356—338** **19 Claims**



11. In a photoelectric system for sensing light deflected from its direction of propagation by microscopic or sub-microscopic particles in a fluid comprising means for sending the fluid along a predetermined fluid path, a light source, a non-transparent surface having a transparent opening therein between the light source and a zone of the fluid path, a photosensor having a light sensitive surface, a first reflecting surface so designed and arranged that it reflects rays reaching it from the said light source toward the transparent opening in the non-transparent surface, a second light reflecting surface so designed and arranged that it reflects light reaching it from the said transparent opening toward the said zone of the said fluid path, and a third light reflecting surface so designed and arranged that it reflects light reaching it from the said zone of the said fluid path toward the said light sensitive surface, the said third reflecting surface being of annular shape so that rays reflected by it from said zone toward the said light sensitive surface surround a space not traversed by these rays, and the said

second reflecting surface being arranged inside this space not traversed by these rays.

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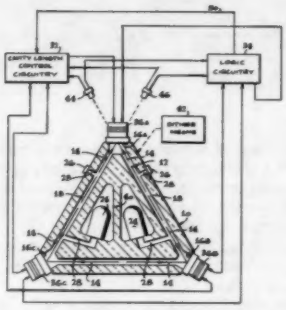
**4,422,762**
**RING LASER**

**Thomas J. Hutchings, Thousand Oaks, and Gary D. Babcock, Mission Viejo, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.**

**Continuation-in-part of Ser. No. 91,019, Nov. 5, 1979, abandoned. This application Aug. 17, 1981, Ser. No. 293,722**
**Int. Cl.³ G01C *19/64***
**U.S. Cl. 356—350** **25 Claims**



**1.** In combination:

a ring laser, including a plurality of corner mirrors defining a ring laser path, transducers to control the inward and outward position of said mirrors, apparatus for detecting the AC amplitudes of the envelopes of two frequency modulated laser traveling waves counterpropagating along said laser path, apparatus for differentially dithering the laser path length, servo means for controlling the position of at least one said transducer and mirror to control and tune the length of the path of said laser;

apparatus connected to said detecting apparatus for producing two signals which are measures of the AC amplitudes of the envelopes of said counterpropagating waves;

summing means connected to receive said AC amplitude signals and to produce a sum signal which is a measure of the sum of said AC amplitude signals; and

means for servoing the position of at least one of said transducers and mirrors to minimize said sum signal.

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**4,422,763**
**AUTOMATIC PHOTOMASK ALIGNMENT SYSTEM FOR PROJECTION PRINTING**

**Hans P. Kleinknecht, Bergdietikon, Switzerland, assignor to RCA Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 967,785, Dec. 8, 1978, abandoned. This application May 27, 1982, Ser. No. 382,424**
**Int. Cl.³ G01B *11/26, 9/02***
**U.S. Cl. 356—356** **12 Claims**

**1.** An automatic projection printing apparatus for aligning a photomask with a semiconductor wafer comprising:

(a) a semiconductor wafer having a plurality of diffraction patterns formed thereon;

(b) a monochromatic light source adapted to have a beam directed onto a selected one of said diffraction patterns;

(c) a key on said photomask, said key being adapted to block portions of said selected one of said diffraction patterns from said beam of said monochromatic light source;

(d) at least four photosensitive elements adapted to receive light from said monochromatic light source after said beam has been reflected from said selected one of said diffraction patterns;

(e) step and repeat stage means for mounting said semiconductor wafer such that said semiconductor wafer can be moved in discrete steps from one position to another, each of said positions containing one of said diffraction patterns;

(f) mounting means for mounting said photomask whereby light from said monochromatic light source can be directed onto said key on said photomask and thereafter directed onto said selected one of said diffraction patterns formed on said semiconductor wafer;

(g) feedback means including said photosensitive elements and said mounting means for aligning said photomask to a selected portion of said substrate by relative linear and rotational movement between said photomask and said

substrate in response to the intensities of light detected by said photosensitive elements; and

(h) optical means comprising a pair of focusing lenses positioned between said source and said photomask for illuminating said key and focusing the portion of said beam not blocked by said key to a location above said wafer, said optical means further comprising a projection lens positioned between said focus location and said wafer for projecting said beam from said focused location to the surface of said wafer,

(i) said optical means and said feedback means being arranged to focus reflected and diffracted beams from said diffraction pattern on said photosensitive elements when said photomask is in alignment with said wafer.

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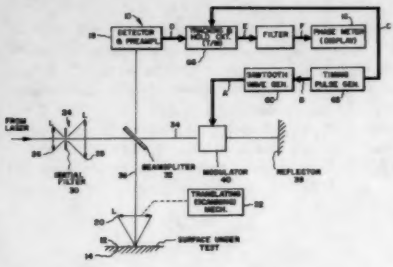
**4,422,764**
**INTERFEROMETER APPARATUS FOR MICROTOPOGRAPHY**

**Jay M. Eastman, Pittsford, N.Y., assignor to The University of Rochester, Rochester, N.Y.**

**Filed Dec. 12, 1980, Ser. No. 215,785**
**Int. Cl.³ G01B *11/02***
**U.S. Cl. 356—357** **18 Claims**

**1.** Interferometer apparatus for measuring the microtopography of the surface of an object which comprises light reflector means, means for dividing a first beam of incident monochromatic light into second and third beams directed towards said surface and said reflector means and for recombining said second and third beams upon reflection therefrom to interfere with each other, means between said dividing means and said surface for focusing said second beam into a spot on said surface, means for moving said focusing means to scan said spot along said surface while said spot is maintained within the

depth of focus of said focusing means, means for phase modulating said third beam, and means for detecting the phase difference between said recombined second and third beams to provide a measure of the microtopography of said surface.

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**4,422,765**

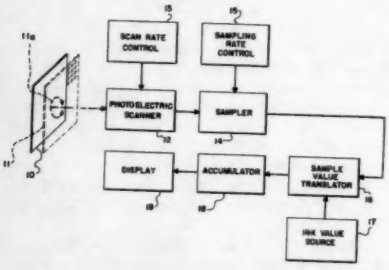
**OFF-SET PRINTING INK CONSUMPTION PREDICTION**

**Ernst R. Hoffman, P.O. Box E, Atglen, Pa. 19310**

**Filed Aug. 20, 1980, Ser. No. 179,767**

**Int. Cl.³ G01N *21/17, 21/84***

**U.S. Cl. 356—432** **6 Claims**




1. In the method of predicting the printing ink consumption of an off-set image, which method includes the steps of photoelectrically scanning the screened image from which the off-set image is to be produced along a linear scanning path, periodically sampling the resulting electrical signal, utilizing the signal samples to produce signal values representing the corresponding ink consumption requirements, and totaling and displaying the so-produced values, the improvement which comprises

analyzing the screened image to determine the scanning and sampling rates which will produce samples reliably corresponding to the density of the image dots, and

performing the scanning and sampling at the rates so determined,

the analyzing comprising

overlaying the screened image consecutively with glass screens having different line numbers,

pivoting each screen back and forth to create moire patterns through interaction between the screen and the image, and

determining the least conspicuous moire pattern so produced.

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**4,422,766**

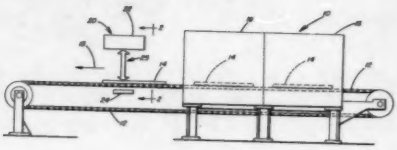
**METHOD OF AND DEVICE FOR REDUCING APPARATUS RESPONSE TIME DURING THE TESTING FOR MOISTURE CONTENT IN MOVING SPACED PLASTIC SHEETS**

**Edward M. Skukalek, Ford City, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jul. 27, 1981, Ser. No. 286,448**

**Int. Cl.³ G01N *21/47***

**U.S. Cl. 356—445** **12 Claims**



1. A method of reducing response time from a non-testing period to a testing period of a testing circuit in a device for measuring moisture content in plastic sheets wherein, during the testing period, energy beams are directed toward a sheet, reflected from the sheet in response to the directed energy beams, and the reflected energy beams are detected to provide a reading corresponding to the moisture content of the sheet, comprising the step of:

reflecting the directed energy beams from a specular surface during the non-testing period to provide the testing circuit with energy for producing a reading substantially within the range of anticipated moisture content readings of the sheet.

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**4,422,767**

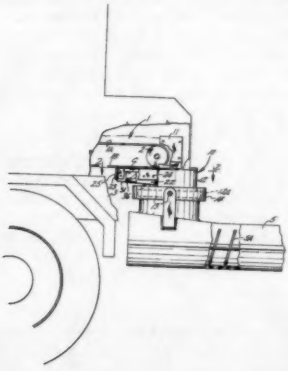
**COMBINATION MOUNTING RING AND CATCH BASIN FOR CONCRETE TRUCKS**

**James E. Yelton, 640 Kingswood, Eugene, Oreg. 97405**

**Filed Jun. 25, 1981, Ser. No. 277,397**

**Int. Cl.³ B28C *7/06, 7/12*; B65G *45/00***

**U.S. Cl. 366—40** **4 Claims**



1. A mounting ring assembly for attachment to a truck chassis and which rotatably supports one end of a delivery trough by which truck transported materials are mixed and discharged, a conveyor belt also supported by the truck chassis for the delivery of the materials to said delivery trough, said mounting ring assembly comprising,

a ring structure through which materials are discharged and on which is rotatably mounted one end of the delivery

trough permitting movement of the latter about a vertical axis,

a catch basin carried by said ring structure and including a bottom wall, side walls and a front wall, means in place on the catch basin and contactable with the lower run of the conveyor belt,

nozzles carried by the catch basin for directing a water spray upwardly against the belt lower run,

said catch basin bottom wall in subjacent spaced relationship with a segment of the belt lower run and in discharge relationship with the ring structure whereby the nozzle spray and belt purged particles gravitate from the catch basin through the ring structure and into the delivery trough, and

positionable means in place on the catch basin and contactable with the lower run of the conveyor belt, said positionable means normally located transversely below the belt run and swingable therefrom to an open position permitting access to the catch basin for periodic cleaning of same.

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**4,422,768**

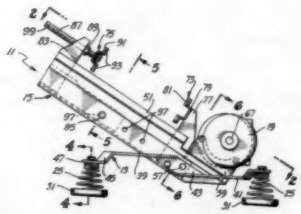
## PAINT CAN SHAKER

**Donald F. Solomon, Costa Mesa, Calif., assignor to Roy Brodsky, Santa Monica, Calif.**

**Filed Mar. 22, 1982, Ser. No. 360,350**

**Int. Cl.³ B01F *11/00***

**U.S. Cl. 366—110** **10 Claims**



1. A shaker for a container comprising:

a container carrier including a generally channel-shaped section having spaced legs joined by a web and diverging wing members extending outwardly from the legs, respectively, of the channel-shaped section to define surfaces for at least assisting in supporting the container;

means for mounting the carrier including resilient means for enabling the carrier to undergo vibratory motion;

means for retaining the container on the carrier including first and second jaws for gripping the container therebetween, at least one of the jaws being partly received in and mounted on said channel-shaped section for movement longitudinally of the channel-shaped section and being fixable in position along said channel-shaped section;

a motor;

means for mounting the motor on the channel-shaped section; and

means driven by the motor for imparting vibratory motion to the carrier.

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**4,422,769**

## MIXING APPARATUS FOR TWO FLOWING LIQUIDS

**Arnoldus G. Holthuisen, Venlo, Netherlands, assignor to Metaalwarenfabriek Venlo B.V., Venlo, Netherlands**

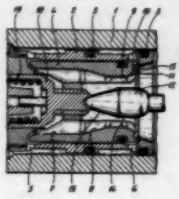
**Filed Mar. 15, 1982, Ser. No. 358,188**

**Claims priority, application Netherlands, Mar. 16, 1981, 8101268**

**Int. Cl.³ B01F *15/02***

**U.S. Cl. 366—178** **6 Claims**

1. A mixing apparatus for two flowing liquids, said apparatus having a first annular inlet for a first liquid and a separate, spaced apart second annular inlet for a second liquid, and also having an outlet for the two liquids after mixing, an external and internal guide for the first liquid in the direction towards the second inlet and the outlet, each of said internal and external guides having an essentially cylindrical portion immediately in front of said second inlet, said external guide being a sleeve body with an essentially cylindrical end portion and having an end face located at said second inlet, and an annular vortex chamber at said second annular inlet in said end face.



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**4,422,770**

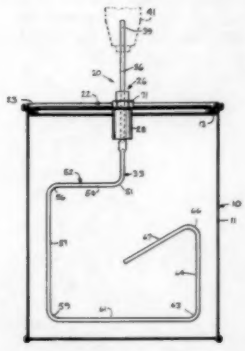
## PAINT STIRRER

**Harry F. Geible, 6975 Wil-O-Paw Rd., Coloma, Mich. 49038**

**Filed Jan. 20, 1982, Ser. No. 340,688**

**Int. Cl.³ B01F *7/32***

**U.S. Cl. 366—248** **5 Claims**



1. An electric drill powered paint stirrer for stirring paint in a conventional paint marketing can of the kind normally closed for sale by a full closing marketing lid, comprising in combination:

a second full closing lid, similar to and substitutable on said can for said marketing lid but having a central opening;

a bushing element having one reduced diameter, externally threaded end extending from a shoulder, the bushing element having a central through bore, said central opening of the second lid being of diameter to snugly receive said threaded end therethrough but not said shoulder, said bushing element being elongate with length substantially exceeding diameter, substantially more than half of the length of said bushing element extending downward beneath the second lid and into the can, with only a minor portion of the bushing extending above the lid,

a nut threadable on said threaded end of said bushing element to clamp said second lid against the said shoulder,

a stirring rod having an upstanding shank extending upward through said bushing element and shaped for chucking in the chuck of a conventional electric drill, said rod having

upper and lower widened portions closely flanking the upper and lower ends of the bushing element for axially locating said shank in said bushing element, said rod having a bottom portion depending from said shank and sized to lie close to the can peripheral wall and bottom for stirring paint in the can, said bottom portion of said rod below said lower widened portion extending down in a continuation of the shank, said continuation being of length small compared to the can diameter, then in an upper radial segment extends radially to near one side of the can, then in a depending segment extends down to near the can bottom, then in a lower diametral segment extends diametrally across the central portion of the can and then in an upstanding segment extends upward near the opposite side of the can to a point spaced below the level of the upper radial segment, and then in a free end segment extends angularly downward toward the center of the can, the upstanding segment extending up for approximately two-thirds the height of the depending segment, the free end segment angling downward therefrom at about 30° from the horizontal and terminating at a point substantially on the axis of the shank and at a height approximately one-third of the way up the depending segment from the lower diametral segment, so that the angled free end segment is spaced vertically a substantial distance from both the upper and lower segments of said rod and radially a substantial distance from the depending segment.

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**4,422,771**

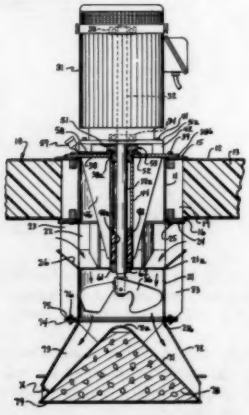
## DOWNFLOW MIXER

**Jack R. Earhart, Rockton; Freddie J. Langdon, Rockford, and John K. Johnson, Stillman Valley, all of Ill., assignors to Aqua-Aerobic Systems, Inc., Rockford, Ill.**

**Filed Oct. 19, 1981, Ser. No. 312,656**

**Int. Cl.³ B01F 7/22**

**U.S. Cl. 366—251** **22 Claims**



1. A downflow mixer for mixing materials in an open surface body of liquid comprising, means for supporting the mixer in an open surface body of liquid, an annular upper casing on the support means defining an upright passage extending from a level above the surface of the body of liquid to a level substantially below the surface of the body of liquid, an upright annular pump casing open at its upper and lower ends, means mounting the annular pump casing on the upper casing with the upper end of the pump casing spaced below the lower end of the upper casing to provide a liquid intake below the upper casing, an electric drive motor, motor mounting means mounting the motor on the upper casing to extend upwardly therefrom, the motor having an elongated one-piece motor shaft with one portion in the motor rotatably supported in upper and lower bearing means in the motor and an extended shaft portion extending downwardly through the upright passage and into the pump casing, an axial flow propeller mounted on the lower end of the extended shaft portion in the pump casing for pumping liquid downwardly therethrough, said motor bearing means being constructed and arranged to carry the entire radial and axial loading on said motor shaft including the end thrust on the shaft produced by said propeller, shaft stabilizer means rigid with said motor mounting means and defining a rigid shaft enclosure surrounding said extended shaft portion and extending downwardly through said upright passage, anti-deflection bearing means on the lower end portion of said shaft stabilizer means dimensioned to normally have a running clearance with said extended shaft portion for limiting deflection of the lower end of said extended shaft portion, wall means extending between the shaft stabilizer means and the upper casing across said upright passage for preventing passage of atmospheric air through the upright passage to the propeller, and mechanical shaft seal means between the shaft stabilizer means and the extended shaft portion at a location above the anti-deflection bearing means for preventing the flow of atmospheric air through said shaft enclosure to the anti-deflection bearing means and propeller.

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**4,422,772**

## MIXING APPARATUS

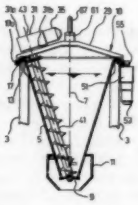
**Rolf Baumgartner, Oftringen, Switzerland, assignor to Rolf Baumgartner AG, Switzerland**

**Continuation-in-part of Ser. No. 103,495, Dec. 14, 1979, abandoned. This application Aug. 7, 1981, Ser. No. 290,868**

**Claims priority, application Switzerland, Dec. 22, 1978, 13070/78**

**Int. Cl.³ B01F 7/14**

**U.S. Cl. 366—287** **15 Claims**



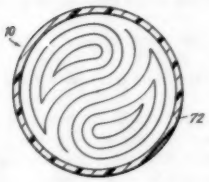
1. A worm mixer comprising a substantially conically shaped vessel with a vertical axis defining a chamber for the mixing of materials, a cover mounted on said vessel allowing rotation of said cover and said vessel relative to each other about the vertical axis of said vessel, an elongated worm mounted to said cover at an off center location and extending within said chamber, drive means connected to said worm above said cover for rotating said worm about its axis, said worm having an upper end extending through a leadthrough of said cover sealing means sealing said leadthrough of said cover to said worm, and at least one bearing for rotatably journalling said worm about its axis near an upper end of said worm and outside of said chamber, said bearing being mounted on the outside of said sealing means, said drive means being arranged and connected with said worm on the outside of said sealing means with respect to said chamber, the interior of said vessel being free of any gear motor and bearing serving to drive and journal said worm, said worm being journalled at its upper end exclusively outside said chamber.

4,422,773

## APPARATUS AND METHOD FOR THE NON-INVASIVE MIXING OF A FLOWING FLUID STREAM

Michael M. Cassaday, Peekskill, and John L. Smith, New City, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Aug. 4, 1980, Ser. No. 175,222
Int. Cl.³ B01F 5/00
U.S. Cl. 366—341 18 Claims



1. A method for the rapid and thorough, non-invasive mixing of two or more components in a fluid stream which is flowing in a single conduit comprising a single inlet and a single outlet which are connected by a single, undivided, unobstructed flow path that is closed to other flow paths, which method comprises the steps of:

establishing a first secondary flow pattern in said fluid stream flowing in a first portion of said conduit; and, thereafter,

establishing a second secondary flow pattern in said fluid stream flowing in a second portion of said conduit which is in close proximity to said first portion prior to the substantial dissipation of said first secondary flow pattern; and

destroying said first secondary flow pattern in said fluid stream flowing in said second portion of said conduit which is in close proximity to said first portion by establishing said second secondary flow pattern therein.

6. In apparatus for the rapid and thorough, non-invasive mixing of two or more components in a fluid stream which is flowing in a single conduit comprising a single inlet and a single outlet which are connected by a single, undivided, unobstructed flow path that is closed to other flow paths, the improvements comprising:

means along a first portion of said conduit to establish a first secondary flow pattern in said fluid stream flowing in said conduit; and

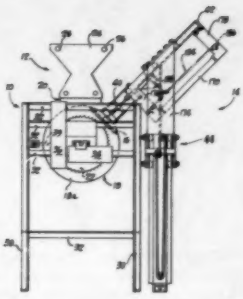
means along a second portion of said conduit positioned in close proximity and relative to said first means so as to establish a second secondary flow pattern in said fluid stream flowing in said conduit prior to the substantial dissipation of said first secondary flow pattern which is effective to destroy said first secondary flow pattern.

4,422,774

## METAL FINISHING BARREL APPARATUS

Frank Little, Au Gres, Mich., assignor to The Harshaw Chemical Company, Cleveland, Ohio

Filed Mar. 20, 1981, Ser. No. 246,010
Int. Cl.³ B01F 9/02, 15/02
U.S. Cl. 366—347 17 Claims



1. A door handling apparatus for removing an access door from a metal finishing barrel or the like, comprising:

(a) means for supporting a barrel in a predetermined aligned position with a portion of said door handling apparatus;

(b) an assembly supported for reciprocating motion towards and away from said barrel supporting means;

(c) means for driving said assembly between a first position wherein said assembly is located adjacent to said barrel and a second position, spaced from said first position;

(d) a pair of rotatable spindles, carried by said assembly engageable with locking structure on a barrel access door, said spindles rotatable between locked and unlocked positions;

(e) a latching mechanism carried by said assembly and engageable with an actuating member forming part of a barrel latching means and operative to move said latching means between latched and unlatched positions;

(f) said assembly including means for maintaining engagement between said assembly and said access door to effect separation of said door from said barrel as said assembly moves to its second position.

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4,422,775

## DEVICE FOR CONTROLLING THE FUNCTIONS OF A WATCH AND FOR DISPLAYING THE STATE OF AT LEAST ONE OF THE CONTROLLED FUNCTIONS

Marcel Thoenig, Granges, Switzerland, assignor to ETA SA, Fabriques d'Ebauches, Granges, Switzerland

Filed Sep. 22, 1982, Ser. No. 421,544
Claims priority, application Switzerland, Sep. 23, 1981, 6129/81
Int. Cl.³ G04B 23/02, 27/02
U.S. Cl. 368—74 6 Claims

1. A device for controlling the functions of an analogue watch provided with a frame and performing a plurality of functions, at least one of which can adopt a plurality of states and for displaying the state of at least one of said controlled functions, comprising:

a stem able to take a plurality of axial positions with respect to said frame;

a member pivotally mounted on said frame and driven by said stem;

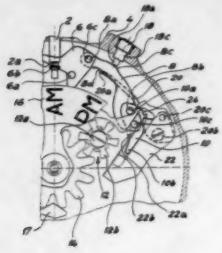
a movable indicator for displaying the states of the controlled function which is visible from out side the watch;

transmission means for driving said indicator;

a mechanism cooperating with said pivotally mounted member to be brought into different positions by said member

and comprising an operative end for cooperating with said transmission means; and

a push button having an inoperative position and an operative position, said push button in the operative position




cooperating with said mechanism for said operative end to produce a movement of said transmission means when said stem is in a predetermined position, and for the said operative end to not act on said transmission means when said stem is in the other position or positions.

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**4,422,776**

## DEVICE FOR CORRECTION OF TIME DATE DISPLAYED BY AN ELECTRONIC WATCH

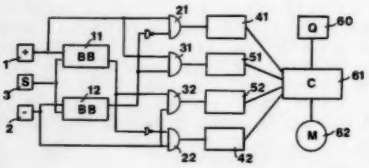
**Aurele Maire, La Chaux-de-Fonds, and Norbert Perucchi, St-Blaise, both of Switzerland, assignors to Compagnie des Montres Longines, Francillon S.A., St-Imier, Switzerland**

**Filed Feb. 1, 1982, Ser. No. 344,646**

**Claims priority, application Switzerland, Feb. 23, 1981, 1173/81**

**Int. Cl.³ G04B *27/02***

**U.S. Cl. 368—185** **5 Claims**




1. A device for correction of data displayed by an electronic watch by means of a crown capable of being rotated in both directions, said device comprising first means of correction for making a first type of correction of the data displayed, the direction of the correction being determined by the direction of rotation of the crown, further comprising,

second means of correction for making, in the same position of the crown, a second type of correction of the data displayed; and

means for detecting a reversal of direction of rotation of the crown after a correction of said first type, and for controlling, in response to that detection, the disconnection of the first means of correction and the connection of the second.

**4,422,777**

## TIME CORRECTING DEVICE FOR TIME SIGNALLING TIMEPIECE

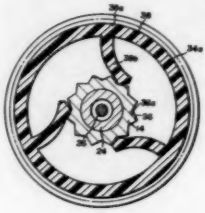
**Norihiko Nakamura, Saitama, Japan, assignor to Rhythm Watch Co., Ltd., Tokyo, Japan**

**Filed Jun. 15, 1982, Ser. No. 388,692**

**Claims priority, application Japan, Jun. 16, 1981, 56-88332[U]**

**Int. Cl.³ G04B *17/12***

**U.S. Cl. 368—185** **5 Claims**



1. A time correcting device for a time signalling timepiece comprising:

a time striking control construction having an hour wheel pipe;

an hour wheel inserted into said hour wheel pipe with clearance; and

a click means coupled between said hour wheel pipe and said hour wheel, said click means comprising:

a click wheel having click teeth corresponding to each of the hour from one o'clock through twelve o'clock; and

a click apparatus having at least one nail portion facing to said click wheel and said nail portion being engagable with said click teeth;

whereby the click action between said click wheel and said click apparatus enables the intermittent rotation between said hour wheel pipe and said hour wheel so that the direct time correction can be performed.

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**4,422,778**

## METHOD FOR MEASURING ASPHALT PAVEMENT TEMPERATURE AND DEVICE FOR IMPLEMENTATION OF THE SAME

**Alexandr A. Shestopalov, prospekt Smirnova, 20, korpus 1, kv. 30; Ernst I. Denikin, Grazhdansky prospekt, 13, korpus 1, kv. 190; Nikolai Y. Kharkhuta, prospekt Smirnova, 37, korpus 1, kv. 20, all of, Leningrad; Alexandr A. Vasiliev, Volzhsky bulvar, 40, kv. 36, Moscow, and Vyacheslav I. Okunev, ulitsa Schepkina, 12, kv. 47, Rybinsk, all of U.S.S.R.**

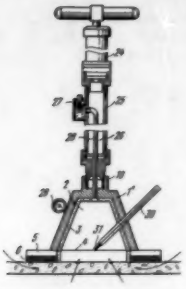
**Filed Dec. 5, 1980, Ser. No. 213,616**

**Int. Cl.³ G01K *13/02*; G01N *25/72***

**U.S. Cl. 374—135** **4 Claims**

1. A method of determining the temperature internally of a porous, aggregate material in a pavement of a road comprising, confining a given area of a surface of an asphalt road pavement while still in a heated state after paving of the road and comprising an aggrevate material which is porous and isolating said area from the ambient atmosphere and simultaneously defining over said area of the surface an enclosed volume of space thermally isolated from the ambient atmosphere, applying a vacuum to said space for drawing into said enclosed volume of space from internally of the pavement aggregate material gases entrained in pores of the porous aggregate material, and sensing the temperature of the gases drawn into said volume of

space with a temperature sensor within said enclosed space, while still in a heated stated after paving of the paving of the



road and thereby to ascertain the temperature of the asphalt pavement.

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**4,422,779**

## HYDRAULIC BEARING SUPPORT

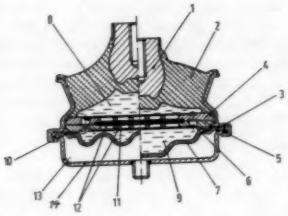
**Arno Hamaekers, Hemsbach; Gerd-Heinz Ticks, Waldmichelbach, and Hans-Joachim Rudolf, Rastede, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany**

**Filed Apr. 24, 1981, Ser. No. 257,170**

**Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019377**

**Int. Cl.³ F16C *27/00***

**U.S. Cl. 384—99** **10 Claims**



1. A working chamber, expansion chamber hydraulic bearing support which comprises: a conical element of elastic material having a bearing base top and a concave bottom in an annular housing, a diaphragm centered between two stop plates mated to the inside circumference of the housing bottom, a flexible bellows forming the expansion chamber mounted on the bottom of the housing, and a nozzle rigidly associated with the inside circumference of the housing bottom or with the stop plates, the nozzle connecting the working and expansion chambers, the ratio of the length to diameter of the nozzle being in the range of 4:1 to 80:1 and the ratio of the volume of the working chamber to the volume of the nozzle being in the range of from 4:1 to 200:1.

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**4,422,780**

## TRANSVERSELY RESTRAINED, LONGITUDINALLY FLEXIBLE MOUNT FOR A BEARING FOR A SPINDLE

**George L. Glaeser, 4258 Mentone Ave., Culver City, Calif. 90230**

**Filed Jan. 12, 1982, Ser. No. 339,719**

**Int. Cl.³ F16C *27/00***

**U.S. Cl. 384—215** **1 Claim**

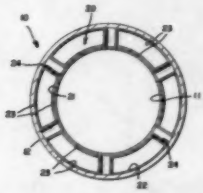
1. A radially restrained, longitudinally flexible mount for use in mounting a bearing for a rotating shaft in a frame, said radially restrained, longitudinally flexible mount comprising:

a. an inner ring which is mechanically coupled to the bearing;

b. an outer ring which is disposed concentricly to said inner ring and which is mechanically coupled to the frame;

c. a frame member which has an inner cylindrical band which is mechanically coupled to said inner ring and an outer cylindrical band which is mechanically coupled to said outer ring;

d. a first flexible coupling member which longitudinally



flexibly couples said inner cylindrical band to said outer cylindrical band whereby said inner ring can bidirectionally move longitudinally along the axis of the shaft;

e. a second flexible coupling member which longitudinally flexibly couples said inner cylindrical band to said outer cylindrical band whereby said inner ring can bidirectionally move longitudinally along the axis of the shaft; and

f. a plurality of spokes which provide lateral rigidity between said inner cylindrical band and said outer cylindrical band so that said inner cylindrical band and said outer cylindrical band are concentric with each other and the axis of the shaft.

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**4,422,781**

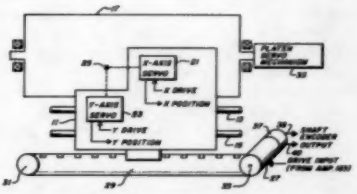
## PRINTING APPARATUS AND METHOD WITH VARIABLE VELOCITY ON-THE FLY PRINTING

**Stephen C. Armfield, Londonderry, and Christopher W. Brock, Bow, both of N.H., assignors to Centronics Data Computer Corp., Hudson, N.H.**

**Filed Mar. 1, 1982, Ser. No. 353,649**

**Int. Cl.³ B41J *3/04***

**U.S. Cl. 400—18** **15 Claims**



1. In a calligraphic printing apparatus having

a moving carriage carrying a movable stylus mechanism,

a carriage control element, and

means responsive to the carriage control element for moving said carriage along a printing path, said printing path being divisible into a plurality of distance-velocity increments,

wherein as said carriage moves along said printing path a plurality of symbols are written by said movable stylus,

the improvement wherein said carriage control element comprises

means for determining, for each distance-velocity increment along said printing path, a maximum carriage velocity,

said maximum carriage velocity being dependent on the complexity of said symbol, and

means responsive to said maximum carriage velocities for determining, for each distance-velocity increment along said printing path, an optimum change in carriage velocity,

whereby said carriage can traverse said printing path at a velocity which varies as a function of the complexities of the particular characters being written by said stylus thereby to provide adequate time over which each character can be written from said moving carriage.

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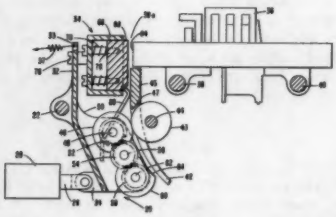
4,422,782

## RECORD MEMBER FEED AND SUPPORT MECHANISM

Raymond L. Lawter, Zanesville; David C. Wills, and Narinder Singh, both of Cambridge, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 28, 1982, Ser. No. 392,449
Int. Cl.³ B41J *11/20*
U.S. Cl. 400—56 10 Claims



1. A mechanism for feeding and supporting a record member with respect to a printing position for receiving printed indicia along a line thereof comprising:

a chute member for guiding a record member disposed therein along a predetermined path, said chute member having an end portion positioned adjacent the printing position;

a first driven roller and a drive roller disposed on opposite sides of said chute member;

an elongated support member rotatably mounted substantially midway between its ends and extending along said chute member, said support member rotatably supporting said first driven roller at a point on one side of the rotatable mounting of said support member;

a platen member mounted on said support member on the opposite side of said rotatable mounting from said first driven roller and positioned adjacent said end portion of the chute member;

first actuating means engaging said support member adjacent said platen for rotating said support member to a first position enabling said first driven roller to engage said drive roller to feed a record member to a printing position adjacent said platen member;

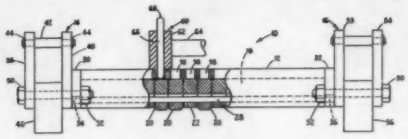
and second actuating means engaging said support member adjacent said first driven roller and operated for rotating said support member to a second position removing the first driven roller from engaging with said drive roller and moving said platen member into engagement with the record member.

4,422,783

## STAMPING APPARATUS HAVING MAGNETIC SUPPORTING MEANS

LeRoy E. Houk, Ellwood, Pa., assignor to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 217,307, Dec. 17, 1980, abandoned.
This application Jan. 17, 1983, Ser. No. 458,681
Int. Cl.³ B41J *1/16*
U.S. Cl. 400—128 5 Claims



1. Apparatus for holding a plurality of stamp members for individually stamping identifying characters of a permanent nature into a tubular metal surface, comprising an elongated frame substantially rectangular in cross-section and having a channel formed in the underside thereof for receiving said stamp members, each of said stamp members comprising a substantially rectangular member having an imprinting character formed on an end face thereof and a transverse groove formed across a side face thereof, and means extending through said groove for retaining said one or more stamp members within said channel while allowing individual movement of each stamp member to stamp the tubular metal surface; said frame having a plurality of holes formed therein opposite said channel and aligned therewith; first and second plates attached to opposed ends of said frame, first and second support assemblies attached to said first and second plates respectively, a first pair of permanent magnets attached to said first support assembly, and a second pair of permanent magnets attached to said second support assembly; each of said support assemblies comprises a pair of spaced-apart, inverted, substantially U-shaped members attached to one of said plates, each of said permanent magnets being received between said U-shaped members and attached thereto adjacent the free ends of the legs thereof; each of said magnets is a horseshoe magnet attached to said U-shaped members by means permitting pivotal adjustment of said permanent magnets to allow said permanent magnets to define spaced leg members supporting said frame in a predetermined position on the tubular metal surface and substantially conforming to the shape of said tubular metal surface.

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4,422,784

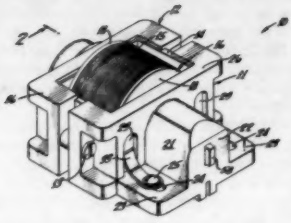
## SOLENOID-TYPE HAMMER ASSEMBLY FOR IMPACT PRINTER

Aram S. Arzoumanian, Encino; Heinz W. Hieber, Valencia; Howard H. Nojiri, Agoura, and Jimmie L. Hart, South Lake Tahoe, all of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Filed Apr. 8, 1982, Ser. No. 366,524
Int. Cl.³ B41J *9/133*
U.S. Cl. 400—144.2 3 Claims

1. In a hammer assembly for a high speed impact printer of the type comprising a solenoid including a coil and an axially-apertured pole piece, said pole piece having a conically-shaped recessed surface, an axially movable armature within said solenoid, said armature having a tapered conical leading surface facing and substantially parallel to said recessed surface of said pole piece, and hammer means, one end of said hammer means being rigidly connected to said armature to form a unitized armature/hammer element for striking a print element in said printer, said hammer means extending through said aperture in said pole piece, the improvement wherein the larger diameter end of said recessed surface of said pole piece has a chamfer which faces said leading surface of said armature

and is tapered at an acute angle relative to the axis of said pole piece which is greater than the angle of taper of said recessed



surface of said pole piece and said leading surface of said armature.

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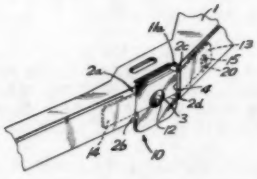
**4,422,785**

## RIBBON CARTRIDGE CONSTRUCTION

Sydney Shore, 38-04 48 St., Long Island City, N.Y. 11004

Filed May 26, 1982, Ser. No. 382,548
Int. Cl.³ B41J *35/26, 35/28*
U.S. Cl. 400—208 8 Claims



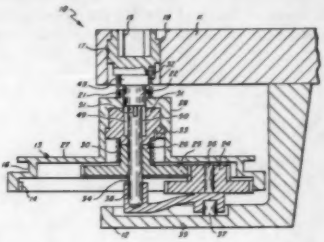
1. In a ribbon cartridge construction having a housing including means forming a ribbon access window at the outer perimeter thereof for exposing a run of ribbon for printing on an oppositely facing surface, a ribbon inlet aperture and a ribbon outlet aperture on either side of the window for the passage of ribbon into and out of the housing and means disposed adjacent said window for shielding all but a predetermined portion of the exposed ribbon from an oppositely facing surface, the improvement wherein: the shielding means comprises a resiliently flexible planar shield including a shielding portion configured to cover the exposed run of ribbon and having a printing aperture corresponding in size to said predetermined portion of the exposed ribbon and first and second elongated mounting arms extending outwardly from the shielding portion in opposite directions and configured to be slidably received in the ribbon inlet and outlet apertures to dispose the shield in an operative position wherein the printing aperture is aligned with the predetermined portion of the exposed ribbon upon the full insertion of both arms; the ribbon inlet and outlet apertures have a width sufficient to receive the mounting arms outwardly of a ribbon passing therethrough; and the cartridge construction further comprises one-way locking means disposed on the first arm and adjacent the corresponding one ribbon aperture for permitting the sliding insertion of said first arm into the one ribbon aperture and for preventing subsequent removal thereof; wherein the one-way locking means comprises a hole in said first arm, guide means disposed adjacent said one ribbon aperture and forming a guide path receptive of said first arm upon insertion in the one ribbon aperture and a first locking projection in the guide path and engageable with said hole.

**4,422,786**

## BIDIRECTIONAL MOTION TO UNIDIRECTIONAL MOTION TRANSLATOR

Paul J. Piptone, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 3, 1980, Ser. No. 202,995
Int. Cl.³ B41J *33/14, 33/04*
U.S. Cl. 400—229 5 Claims



1. A bidirectional motion to unidirectional motion translator in combination with an impact printer of the type utilizing a printhead and a platen, having a unidirectional print ribbon mechanism, wherein the translator is activated by the left to right and right to left motions of the printhead relative to the platen, the unidirectional output of the translator activating the print ribbon mechanism, comprising:

(a) a drive cable connected to opposite sides of the frame of the printer;

(b) rotationally mounted housing means, having an axial bore therethrough, and having a flange around which the driven cable is wound, relative in one direction or the opposite direction depending upon the relative direction of motion between the printhead and the platen and the resultant winding and unwinding of the drive cable;

(c) a driven shaft rotatably mounted within the bore of the housing means;

(d) upper clutch means positioned at the upper end of the driven shaft and adapted to selectively engage the driven shaft and the housing means, operable to turn the driven shaft in a fixed direction when the housing means rotates in the one direction, and to cause the driven shaft to slip when the housing means rotates in the opposite direction;

(e) rotational engaging means, rotated by the housing means in a direction opposite to that of the housing means; and

(f) lower clutch means positioned at the lower end of the driven shaft and adapted to selectively engage the driven shaft and the rotational engaging means, operable to turn the driven shaft in the fixed direction when the housing means rotates in the opposite direction causing the engaging means to rotate in the one direction, and operable to cause the driven shaft to slip when the housing means rotates in the one direction causing the engaging means to rotate in the opposite direction, whereby the driven shaft rotates in the fixed direction when the housing means is rotated in either the one or the opposite direction.

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**4,422,787**

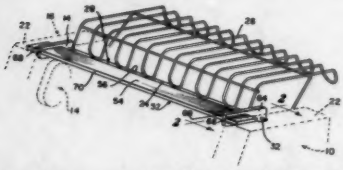
## TEAR BAR FOR A PRINTER

George L. Guthrie, 2938 E. 62nd St., Indianapolis, Ind. 46220

Filed May 10, 1982, Ser. No. 376,719
Int. Cl.³ B41J *15/00*
U.S. Cl. 400—621 4 Claims

3. A tear bar for a printer including a hood covering the printer mechanism, the hood defining an opening through which paper fed through the printer exits, and support means comprising a paper bail mounting bar disposed generally at the ends of the opening adjacent the paper edges, the printer including a paper bail, the tear bar including a tearing edge

adjacent the surface of the paper as the paper is fed through the opening, the tearing edge extending generally across the opening and beyond the edges of the paper fed therethrough, the tear bar further including a pair of ears on the tear bar for selectively engaging the support means, the ears being secured to the tearing edge such that engaging the support means with the ears mounts the tear bar from the support means for movement between use and non-use positions, the ears positioned on the tear bar beyond the edges of the paper fed therebetween, each of the ears defining an opening for receiving a respective end of the paper bail mounting bar to mount the tear bar from



the paper bail mounting bar, the paper bail mounting bar including stops formed by the connection of the paper bail to the paper bail mounting bar, the ears being incapable of being advanced beyond the stops to permit sliding engagement of the ears on the paper bail mounting bar, and one of the ears including means defining a groove between its perimeter and the means defining an opening in said one of the ears, the groove providing additional clearance for the entry of the paper bail mounting bar into the opening associated with the groove, the tear bar in its use position presenting the tearing edge in operative position to permit a user to tear the paper as it exits from the printer.

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**4,422,788**

## APPARATUS FOR FEEDING A LIQUID TO AN APPLICATOR

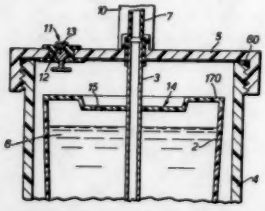
**John D. Braithwaite, Maidenhead; Derrick O. King, Old Windsor, and Sidney J. Williams, Virginia Water, all of England, assignors to Black & Decker Inc., Newark, Del.**

**Continuation of Ser. No. 194,452, filed as PCT GB 79/00131, Aug. 3, 1979, published as WO 80/00315, Mar. 6, 1980, & 102(e) date Apr. 9, 1980. This application Mar. 16, 1982, Ser. No. 358,821**

**Claims priority, application United Kingdom, Aug. 9, 1978, 32726/78**

**Int. Cl.³ A43K *5/02***

**U.S. Cl. 401—188 R** **36 Claims**



1. A portable apparatus for feeding paint under pressure to an applicator, comprising:

an outer vessel;

a paint container received, in use, within the interior of the vessel with part of the interior of the vessel remaining for occupancy by gas;

said container having a lid fitted thereto and extending over the top thereof;

a pressurizing assembly supported by the vessel, and including a housing having a capsule of pressurized gas therein and further having pressure reducing means therein, the pressure reducing means having a high pressure side and a low pressure side;

a first fluid path extending from the high pressure side of the pressure reducing means and communicating with the outlet of the pressurized gas capsule;

a second fluid path extending from the low pressure side of the pressure reducing means through the vessel and into the container whereby the interior of the container can be pressurized;

a feed conduit connected, in use, to the applicator, said feed conduit extending into the vessel from the exterior thereof and extending into the interior of said container for transferring paint therefrom to the applicator;

said lid having a hole therein and said feed conduit extending through said hole and being removable and insertable therethrough as a close fit therein; and

restricted transfer means, associated with the paint container and communicating with said part of the interior of the vessel and the interior of the paint container, for allowing flow of gas between said part of the interior of the vessel and the interior of the paint container to equalise the pressures therein, but for preventing passage of paint therethrough, except at a very slow rate, from said container into said part of the interior of the vessel;

the combination of the paint container having said lid, said feed conduit having said close fit with respect to said hole in said lid, and the functioning of said restricted transfer means substantially preventing paint from contaminating the interior of said outer vessel, even if during use the vessel is inadvertently knocked over.

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**4,422,789**

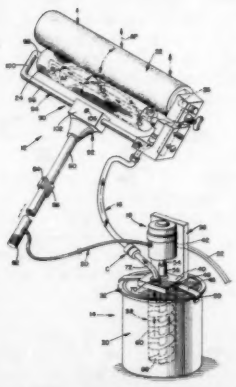
## FLUID APPLICATOR WITH FEEDER ROLLER

**Joseph C. Charney, 7915 N. Fairfield Rd., Milwaukee, Wis. 53217; Phillip M. Goodman, 9018 N. 70 St., Milwaukee, Wis. 53223, and Robert H. Morgan, 3745 S. 76th, Milwaukee, Wis. 53220**

**Continuation of Ser. No. 193,001, Oct. 2, 1980, abandoned. This application Feb. 1, 1982, Ser. No. 344,545**

**Int. Cl.³ B43M *11/02***

**U.S. Cl. 401—218** **12 Claims**



1. A fluid applicator for applying fluid, such as paint or the like, to a surface, comprising:

a source of fluid;

a pump fluidly connected to said source of fluid;

a frame having a fluid passage therein fluidly connected to said pump;

a fluid applicator roller rotatably mounted on said frame;

a fluid dispersing roller rotatably mounted on said frame to contact said fluid applicator roller, said fluid dispersing roller including a central fluid passage defined to extend

axially of said fluid dispersing roller and to be in fluid communication with said frame fluid passage to receive fluid therefrom, a plurality of fluid transfer passages extending radially of said fluid dispersing roller and being in fluid communication with said central fluid passage, and a pair of helical fluid troughs defined in the outer surface of said fluid dispersing roller to be in fluid communication with said transfer passages to receive fluid therefrom, said helical troughs each intersecting each fluid transfer passage and each having a width dimension which decreases to a minimum adjacent a transfer passage, each of said helical fluid troughs including a ridge within each trough to establish capilliary action, said pump pressurizing fluid in said helical ridged troughs; and

control means on said frame for controlling said pump.

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**4,422,790**

## CONNECTING MEANS FOR FILTER CARTRIDGES

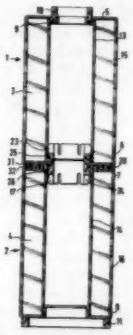
**Hans Gebert, Heilbronn; Manfred Löffelhardt, Obersulm, and Gerhard Obernosterer, Öhringen-Ohrnberg, all of Fed. Rep. of Germany, assignors to Knecht Filterwerke GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Mar. 25, 1982, Ser. No. 361,881**

**Claims priority, application Fed. Rep. of Germany, Apr. 4, 1981, 3113640**

**Int. Cl.³ F16B *1/00***

**U.S. Cl. 403—11** **3 Claims**



1. Means for connecting at least two filter elements, which are axially arranged in series and are designed as filter cartridges, of a fluid filter, more especially a lubricating-oil filter for internal-combustion engines, characterised in that the connecting means is designed as a joint for tilting the filter cartridges relative to each other during the installation and removal thereof, said connecting means being in the form of a clip hinge made of a plastics-material injection moulding provided with an integrally formed film hinge, said clip hinge engaging with its free ends in the inner ports in the respective end discs of the filter elements, said clip hinge having free ends comprising detents which engage over the end discs of the filter elements, and having two other ends which in the installed position are in operative engagement with each other and comprise conically extending ring sections, which correspond to each other.

**4,422,791**

## UNIVERSAL JOINT CONSTRUCTION FOR USE IN ANCHORING A SURFACE PLATFORM TO A SEA BED

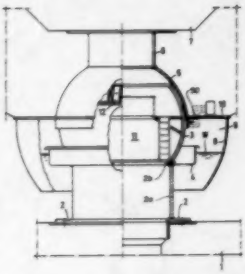
**Helmut Lausberg, Oberhausen, and Karl-Werner Pommerening, Dortmund, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg Nürnberg Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Apr. 7, 1982, Ser. No. 366,207**

**Claims priority, application Fed. Rep. of Germany, Apr. 27, 1981, 3116626**

**Int. Cl.³ F16C *11/00***

**U.S. Cl. 403—39** **26 Claims**



1. A universal joint for use in anchoring sea platforms to a sea bed which is adapted to be disposed adjacent the sea bed, comprising an outer top ball cup having a bottom opening with an edge around the opening, an inner bottom ball cup disposed within said outer top ball cup and enclosing the bottom thereof and having an exterior in slidable engagement with an interior of said outer top ball cup, a bell forming an enclosed pressure space between the exterior of said top ball cup and said inner bottom ball cup, a ring seal bearing defined between said inner bottom ball cup and said outer top ball cup adjacent the edge of said outer top ball cup, said inner bottom ball cup exterior between said ball cups having a plurality of shoes thereon bearing in sliding engagement against the interior of said outer top ball cup and each comprising a support plate having a substantially closed contour area defined by an enclosing border thereabout, each supporting plate secured to said inner bottom ball cup, a sliding layer within said contour area secured to said supporting plate and slidable on the interior of said outer top ball cup, and a border seal extending around the periphery of each of said supporting plates.

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**4,422,792**

## GUSSET METAL LEDGER HANGER

**Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.**

**Filed Aug. 16, 1982, Ser. No. 408,242**

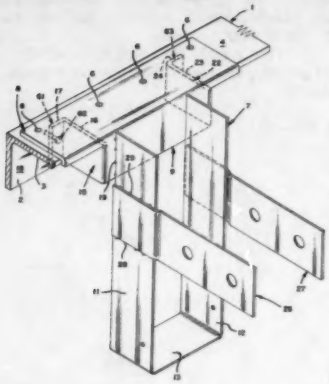
**Int. Cl.³ F16B *5/00***

**U.S. Cl. 403—232.1** **6 Claims**

1. In combination a gusset metal ledger hanger for attachment to a metal ledger 1 wherein the metal ledger includes a lower leg 2 attached to the face of a wall and an outstanding leg 3 having an upper face 4 and a lower face 5, said ledger hanger including; a top flange 8 adapted for connection to said upper face 4 of said outstanding ledger leg 3, a depending flange 9 attached to said top flange 8 extending downwardly therefrom, first and second stirrup members 11 and 12 attached to said depending flange 9 extending downwardly therefrom and adapted for holding a structural beam member, a first gusset member 15 operatively and ridgedly connected to said top flange 8 having a top edge 16 in registration with said lower face 5 of said outstanding leg 3 of said ledger and having a side face 17 in close fitting relation to said outward face 18 of said lower leg 2 of said metal hanger 1, and said gusset member

is an integral part of said depending flange 9; said improvement comprising:

a. a first gusset foot 61 attached to said first gusset member 15



at a right angle thereto and positioned in face to face contact with said ledger lower leg 2; and

b. fastening means 62 adapted for permanently attaching said first gusset foot 61 to said ledger lower leg 2.

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4,422,793

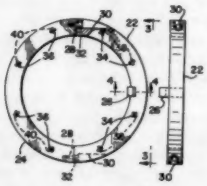
**SPLIT COLLAR SPACER RING ASSEMBLY**

George E. Mandich, 6202 Johnson St., Merrillville, Ind. 46410

Filed Jun. 29, 1981, Ser. No. 278,645

Int. Cl.³ B25G *3/00;* F16B *9/00;* F16L *41/00*

U.S. Cl. 403—261 7 Claims



1. A split collar spacer ring means adapted to hold an elongated shaft means having a longitudinal groove and a circumferential side wall within a space defined by a sleeve means having an end wall, said side wall having an annular collar groove with a bottom end wall substantially parallel to the longitudinal axis of said elongated shaft means which comprises: first collar means removeably placed in a portion of said annular collar groove, said first collar means including first and second ends and a projection placed into said groove; second collar means removably placed in a further portion of said annular collar groove, said second collar means including first and second ends, said first and second collar means being removably joined together so that said first ends and said second ends of said first and second collar means abut each other, respectively, to surround and be affixed to said shaft means; a plurality of fastener means each including an elongated bolt removably secured to said joined first and second collar means and being situated in a direction substantially normal to the central axis of said joined first and second collar means; spacer means between said joined first and second collar means and said end wall abutting at least a portion of said end wall; and a plurality of both first and second bolt means, secured in a corresponding plurality of holes in said first and second collar means, respectively, and contacting said spacer means.

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4,422,794

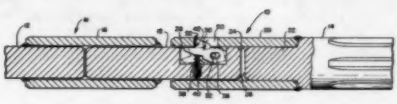
**COUPLING FOR EARTH BORING UNITS**

Arthur D. Deken, Perry, Okla., assignor to The Charles Machine Works, Inc., Perry, Okla.

Filed Jul. 21, 1981, Ser. No. 285,501

Int. Cl.³ B25G *3/18;* F16B *21/00;* F16D *1/00*

U.S. Cl. 403—330 4 Claims



1. A coupling for coaxially joining pipe or rod sections in load transmitting relation to be employed with an earth boring drive unit comprising:

a first elongated member having a generally annular wall with the inner surface of said wall defining an axially opening cavity of polygonal cross-sectional throughout at least a portion of the length of said cavity, said wall being formed with a recess opening into such cavity;

a second member having an exterior surface formed with a pocket opening outwardly thereof, said second member further having an elongate segment telescopically engageable within said cavity, said segment being provided with an exterior cross-section configured to drivingly mate with said polygonal cross-section of the cavity to transmit torque between said members;

each of said members providing means remote from the telescopically interengageable portions thereof to affix the member to a pipe or rod section;

a mounting pin carried by said second member and extending transversely within said pocket;

a load transmitting latch in said pocket having an enlarged transverse bore loosely enclosing said pin for said latch to be capable of limited movement normal to the axis of said pin and pivot on said pin from within said pocket outwardly beyond said exterior surface of said second member;

biasing means urging said latch outwardly to engage within said recess of said first member when said members are interengaged in load transmitting relation;

abutment means in said first member cavity with which said second member engages when said elongate segment is telescoped into said cavity to transmit axially compressive loads through said members;

said recess providing an abutment wall against which said latch engages to lock said members against axial separation upon tension being applied to said members; and

said pocket providing a stop wall to limit movement of said latch within said pocket, said latch transmitting axial tension loads applied to said coupling by simultaneous engagement of said latch with both said abutment wall and said stop wall, said latch bore being out of contact with said mounting pin when said simultaneous engagement occurs and said latch transmits said tension loads.

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4,422,795

**COMPACTOR**

Aubrey R. Berrange, 011 Naboon, Leicester Rd., Bedfordview, Johannesburg, Transvaal, South Africa

Filed Apr. 8, 1980, Ser. No. 138,378

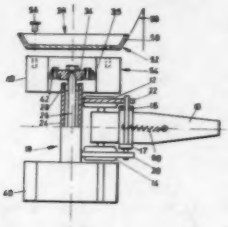
Claims priority, application South Africa, Apr. 9, 1979, 79/1666; Jun. 12, 1979, 79/6616

Int. Cl.³ E01C *19/26*

U.S. Cl. 404—124 14 Claims

1. A compactor which comprises a chassis adapted to be

drawn by tractive means, two laterally separated impact rollers of substantially identical non-circular profile, stub axle means operatively related to the chassis and supporting each impact roller for rotation, and torsion means connecting the impact



rollers to each other to constrain the impact rollers to rotate substantially in synchronism with each other, but torsionally permitting a degree of out-of-synchronism movement in response to torsional forces.

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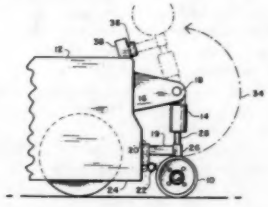
4,422,796

## HYDRAULICALLY ADJUSTABLE PAVEMENT ROLLER

Boyd D. Tavernier, P.O. Box 11915, Reno, Nev. 89510

Continuation of Ser. No. 120,640, Feb. 11, 1980, abandoned.
This application Jun. 29, 1981, Ser. No. 278,324
Int. Cl.³ E01C *19/26*
U.S. Cl. 404—128 6 Claims



1. An auxiliary roller accessory system for a vehicle for rolling a surface outside of the normal rolling track of said vehicle, said roller accessory system comprising:

a support structure rigidly mountable to the rear body of the vehicle, said support structure including a support bracket extending outwardly from said vehicle;

a hydraulically operable cylinder pivotally connected to the end of said bracket distal of said vehicle, said cylinder having a movable piston;

a roller having an axle coupled to said piston, said roller being movable in a vertical direction upon hydraulic actuation of said piston;

a slidable bracket having a first end connected to said roller axle and a second end having a connected cross member; and

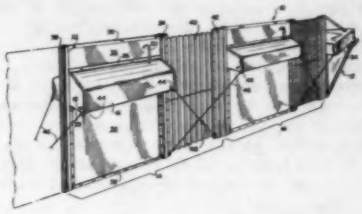
socket means coupled to said vehicle and positioned to loosely engage the cross member on said slidable bracket for maintaining both the rolling alignment of said roller and the substantially vertical alignment of said hydraulic cylinder.

4,422,797

## FIRE RESISTANT OIL SPILL CONTROL BOOM

Ian R. McAllister; Ian A. Buist, and William M. Pistruzak, all of P.O. Box 200, Calgary, Alberta, Canada T2P 2H8

Filed Feb. 16, 1982, Ser. No. 348,877
Int. Cl.³ E02B *15/04*
U.S. Cl. 405—70 15 Claims



1. A fire resistant spillage containment boom, said boom including a pluraiity of units capable of being connected together, each of said units comprising a float member, a first panel member extending vertically above said float member, a second panel member extending vertically below said float member, first and second frame members secured to opposite ends of said float member, each of said frame members extending above and below said float member and secured to said first and second panel members, said first frame member including a first channel shaped connecting element, a corrugated panel having vertically disposed corrugations and being substantially coextensive with and secured to said second frame member along a first longitudinal edge thereof, a second channel shaped connecting element attached to the second longitudinal edge of said corrugated panel, shock absorbing means for controlling the flexing of said corrugated panel, a connecting member for connecting the first connecting element of one of said units to the second connecting element of the adjacent unit in said boom, said float member, said panel members, said corrugated panel, said connecting elements, and said connecting member each being formed of a metal capable of withstanding the temperature of a petroleum fire.

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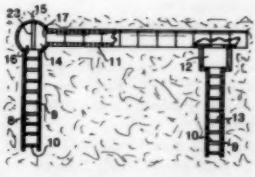
4,422,798

## PROCESS FOR CONSTRUCTION OF AN UNDERGROUND STRUCTURE AND THE STRUCTURE THUS OBTAINED

Jacques Bonvoisin, Beaufoy, Belgium, assignor to Compagnie Internationale des Pieux Armes Frankignoul, Liege, Belgium

Filed May 6, 1981, Ser. No. 260,995
Claims priority, application Belgium, May 8, 1980, 0/200526
Int. Cl.³ E21D *9/04*
U.S. Cl. 405—132 8 Claims



1. Process for the construction of an underground structure, particularly a tunnel, of the type comprising:

the construction of a first longitudinal underground passage;

the construction of a first lateral wall, preferably of concrete, in a vertical direction and defining a first lateral side of said structure, this wall being obtained by filling a trench dug from said first passage;

driving a series of first mechanically resistant pipes into the soil from said passage, preferably horizontally and perpendicular to the plane of said trench, said pipes being intended to form the roof of said structure;

construction before or after the said driving, of a second underground passage parallel to the first and adjacent to said first pipes;

construction, in an analogous manner to the first, of a second lateral wall, in a vertical direction and defining another lateral side of said structure;

covering with concrete of said passages and said pipes;

said process being characterized in that it consists of constructing at least one of said passages by means of a series of second mechanically resistant pipes, driven into the soil; then digging said trenches from first openings provided on the lower side of said second pipes and in driving said first pipes from second openings provided on a lateral side of said second pipes.

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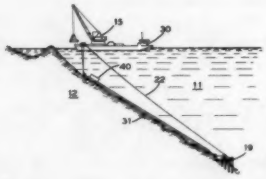
**4,422,799**

## METHOD FOR INSTALLING SUBMARINE PIPELINES USING A MARINE RAILWAY SYSTEM

**William L. Green, New Orleans; Dennis E. Calkins, Metairie; Gary E. Harrison, Marrero, all of La., and Jesse R. Wilkins, Picayune, Miss., assignors to McDermott Incorporated, New Orleans, La.**

**Filed Jun. 1, 1981, Ser. No. 268,557**
**Int. Cl.³ F16L *1/00***
**U.S. Cl. 405—158** **11 Claims**




1. A method of installing a submarine cold water conduit on the bottom of a body of water to an underwater land formation having an upslope and downslope area comprising the steps of:

(a) attaching a railway leader to a track pulldown cable, the railway leader including a sheave through which is reeved a conduit pulldown cable,

(b) rigidly fastening the railway leader and successive railway track sections to each other to construct a marine railway track means while simultaneously threading each track section with the conduit pulldown cable and pulling the track pulldown cable to control descent of the railway track sections,

(c) lowering the track means onto the bottom,

(d) securing the track means to the bottom,

(e) releasably attaching the reeved conduit pulldown cable to a first section of the cold water conduit and pulling the first cold water conduit section into position on the track means using the reeved conduit pulldown cable,

(f) securing the first cold water conduit section to the track means and repositioning the conduit pulldown cable for attaching to another section of the cold water conduit, and

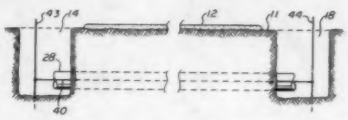
(g) repeating steps (e) and (f) for each successive cold water conduit section until all conduit sections are in place.

**4,422,800**

## METHOD OF INSTALLING AN UNDERGROUND CONDUIT

**Robert O. Parish, assignor to Doc's Road Boring, Inc., Houston, Tex.**

**Filed Nov. 21, 1980, Ser. No. 208,981**
**Int. Cl.³ E21C *9/00, 23/00***
**U.S. Cl. 405—184** **3 Claims**




1. A method of facilitating the future installation of a proposed conduit in the earth below a grade parallel to and spaced apart from an adjacent conduit, which comprises the steps of:

digging a first pit into said earth adjacent said grade, said first pit being located on the vertical plane that intersects the course of said adjacent conduit and having a depth at least as deep as the depth of said adjacent conduit below said grade;

and digging a second pit into said earth adjacent said grade, said second pit being spaced apart from said first pit and being located on said vertical plane and having a depth at least as deep as the depth of said adjacent conduit below said grade;

forming a pilot hold in the earth extending between said first and second pits paralled to and spaced apart from said course to be traveled by said proposed conduit;

reaming said pilot hole to form said enlarged hole having a diameter sufficient to accommodate said adjacent conduit;

attaching an end of a cable to said adjacent conduit, said end being attached radially outwardly from said adjacent conduit;

and running said adjacent conduit through the earth between said first and second pits along a course parallel to the course of said proposed conduit, thereby pulling said cable through the earth adjacent thereto;

fixing one end of said cable to a first stake;

fixing the other end of said cable to a second stake;

filling said first pit with earth of the level of said grade with said first stake exposed;

and filling said second pit with earth up to the level of said grade with the second stake exposed.

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**4,422,801**

## BUOYANCY SYSTEM FOR LARGE SCALE UNDERWATER RISERS

**Neville E. Hale, Mississauga, Canada, and Kenneth Gardner, Santa Barbara, Calif., assignors to Fathom Oceanology Limited, Mississauga, Canada**

**Filed Sep. 11, 1980, Ser. No. 186,506**
**Claims priority, application Canada, Sep. 28, 1979, 336655**
**Int. Cl.³ E21B *7/12***
**U.S. Cl. 405—195** **14 Claims**

1. A canister for use in association with a plurality of similar canisters, superimposed one on another, for providing buoyancy control of large scale underwater risers, comprising:

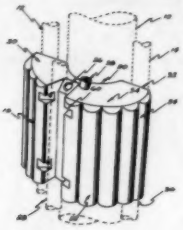
a floodable, hollow structure with a curved, vertical rear wall having a contour approximating in curvature the outer diameter of a riser section with which said canister is to be employed; a curved vertical front wall extending arcuately substantially in parallel with said rear wall; vertical side walls; and top-forming and bottom-forming walls;

internal conduit means for providing air communication between superimposed canisters;

an air inlet in the bottom wall comprising a tube extending partially into the interior of said canister and connected to

a source of compressed air supplied thereto from below said canister;

a water outlet in said bottom wall permitting displacement of water from the interior of said canister upon the injection of compressed air at a pressure sufficient enough to expel water therefrom; and,



a port in said conduit means to permit air communication to said conduit and thence through said conduit to the canister next above so as to supply compressed air to said air inlet in said next above canister, whereby said internal conduit comprises the source of compressed air for said next above canister.

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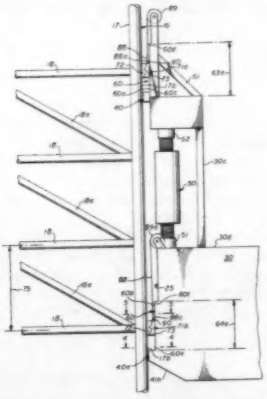
**4,422,802**

## LEG LOAD DISTRIBUTION AND LOCKING ARRANGEMENT FOR JACK-UP TYPE MOBILE OFFSHORE PLATFORM

**Kenneth P. Choate, Houston, Tex., assignor to Robin Shipyard (PTE.) Ltd., Singapore, Singapore**

**Filed Apr. 7, 1981, Ser. No. 251,775**
**Int. Cl.³ E02B 17/00**
**U.S. Cl. 405—198** **24 Claims**



1. In a jack-up type mobile offshore structure wherein a hull provides a working area platform with openings therethrough for receiving vertically extending legs and wherein a cooperating jacking arrangement between the hull and legs enables the legs to be lowered onto a subsea surface so that the hull may then be moved on the legs to an elevated position above the water for conducting drilling or other operations, the invention comprising means to secure the structure and legs together, said means including:

a. a plurality of vertically extending guide means carried by the hull and spaced about each of the legs;

b. a first pair of wedges forming first wedge means movable vertically in said guide means;

c. a second pair of wedges forming second wedge means spaced vertically in said guide means relative to said first wedge means, said second wedge means movable vertically in said guide means;

d. means interconnecting said pair of wedges which forms said first and second wedge means wehreby at least one of the wedges of each of said first and second wedge means may be moved to engage a leg and thereby secure the legs to the structure; and

e. means to raise and lower said wedge means in said guide means.

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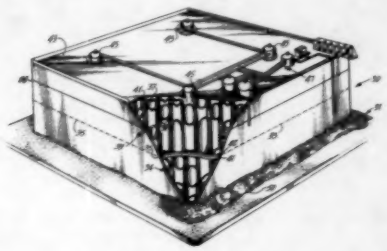
**4,422,803**

## STACKED CONCRETE MARINE STRUCTURE

**Sherman B. Wetmore, Westminster, Calif., assignor to Global Marin, Inc., Los Angeles, Calif.**

**Filed Nov. 30, 1981, Ser. No. 325,778**
**Int. Cl.³ E02B 17/00**
**U.S. Cl. 405—204** **13 Claims**



1. A concrete offshore structure located in water of selected depth and extending from a surface defining the bottom of the water body to above the water surface and comprising at least two similar prefabricated concrete modular subassemblies interconnected in a vertical arrangement in such manner to define a horizontal interface between each such pair of subassemblies,, vertical guide tubes cooperatively disposed in each of said subassemblies, said guide tubes adapted to at least partially register with one another when said subassemblies are vertically arranged, a shear pin adapted to be received by said cooperating guide tubes to prevent relative movement between said subassemblies, said shear pin having a leading edge to positively align said cooperating guide tubes and thereby said subassemblies when received into said guide tubes, and cement between each such pair at each interface for securing the members of each pair together.

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**4,422,804**

## GRAVITY BASE OF OFFSHORE PRODUCTION PLATFORM WITH ICE-PENTRATING PERIPHERAL NOSE SECTIONS

**Ben C. Gerwick, Jr., Oakland, Calif.; Edward B. Price, Dallas, and Thomas P. Taylor, Duncanville, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.**

**Filed Dec. 10, 1981, Ser. No. 329,372**
**Int. Cl.³ E02B 17/00**
**U.S. Cl. 405—210** **13 Claims**

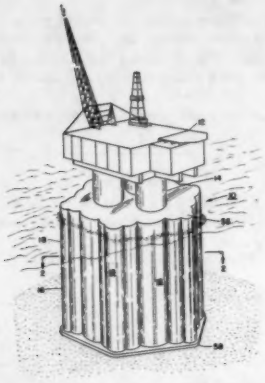
1. A gravity base offshore production platform structure including an above-water platform section and a support section extending from the marine floor to said platform section, said support section comprising:

at least one shaft extending from the marine floor to said platform section;

an array of vertically extending oil storage compartments; and

an array of vertically extending ballast compartments about

said oil storage compartments and said at least one shaft, said array of ballast compartments forming protruding scallop-like or starpoint portions about the periphery of



said support section for absorbing maximum anticipated iceberg thrust forces and punching shear, whereby local punching failures as a result of iceberg impact are confined to said scallop-like or starpoint portions.

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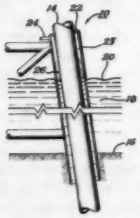
**4,422,805**

## METHOD OF GROUTING OFFSHORE STRUCTURES

**Ronald E. Sweatman, Fountain Valley, Calif., assignor to Hughes Tool Company, Houston, Tex.**

**Continuation of Ser. No. 221,946, Dec. 31, 1980, abandoned.**
**This application Jun. 20, 1983, Ser. No. 504,241**
**Int. Cl.³ E02B *17/00*; E02D *5/34***
**U.S. Cl. 405—225** **3 Claims**



1. A method of grouting an offshore structure having a vertically extending outer jacket and a pile mounted inside of and spaced from said jacket to form a space therebetween comprising:

closing the top of said space;

forcing a generally water-immiscible, quick setting, initially fluid material into said space to displace water downwardly out of said space, the density of said material being less than that of the water it displaces by at least 0.1 pounds per gallon;

forcing a low density aerated cement slurry into said space on top of said material thereby positioning said material proximate the bottom of said space, the density of said aerated slurry being less than that of said material by at least 0.1 pounds per gallon;

allowing said material to set;

pumping a conventional unaerated cement slurry into said space under pressure, thereby collapsing said aerated cement slurry; and

allowing the collapsed cement slurry to set.

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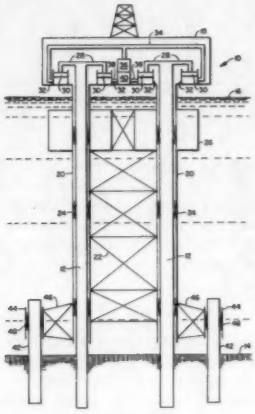
**4,422,806**

## SLIDING TENSION LEG TOWER

**Barry J. Abbott, Concord, and William H. Silcox, San Francisco, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.**

**Filed Feb. 17, 1981, Ser. No. 235,194**
**Int. Cl.³ E02B *17/00***
**U.S. Cl. 405—227** **7 Claims**



1. An offshore drilling and producing structure, which comprises:

a rigid platform including equipment associated therewith;

a plurality of open-ended sleeves affixed to the platform and extending downwardly therefrom for a substantial distance below the water surface, in a substantially vertical orientation;

an equal plurality of axial piles secured to the sea floor which extend upwardly into said open-ended sleeves to at least a position near the surface of the water;

buoyant means affixed to said sleeves below the water line for providing an upward buoyant force in excess of the weight of said platform including equipment associated therewith and said sleeves;

means for counterbalancing the excess buoyant force from the plurality of axial piles said means permitting simultaneous vertical movement of each of said sleeves with respect to each of said piles to permit a desired degree of compliancy of rotation about the sea floor.

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**4,422,807**

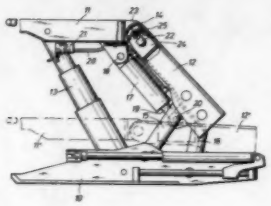
## MINE ROOF SUPPORTS

**Michael Dettmers, Kamen; Walter Weirich, Dortmund, and Bernd Peters, Dülmen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany**

**Continuation of Ser. No. 216,200, Dec. 15, 1980, abandoned.**
**This application Dec. 20, 1982, Ser. No. 451,447.**
**Claims priority, application Fed. Rep. of Germany, Jan. 5, 1980, 3000237**
**Int. Cl.³ E21D *15/44***
**U.S. Cl. 405—296** **13 Claims**

1. In a mine roof support with a roof-engageable structure, the goaf shield pivotably connected to said roof-engageable structure and hydraulic props operable to raise and lower said roof-engageable structure, a hydraulic valve device and means

for operating said device to prevent operation of the props whenever the roof-engageable structure and the goaf shield reach a pre-determined relative angular disposition, the improvement comprising: the valve device and the operating means are mounted separately from said hydraulic props and directly to the roof-engageable structure and the goaf-shield in



a protected position which is in the region of the axis of pivotal connection between the roof-engageable structure and the goaf-shield and which allows the valve device and the operating means to move angularly in relation to one another in correspondence with a change in the angular disposition of the roof-engageable structure and the goaf-shield.

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**4,422,808**

## HYDRAULICALLY-OPERATED DEVICES

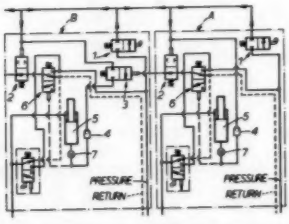
**Stephen P. Cook, Walton, England, assignor to Dowty Mining Equipment Limited, United Kingdom**

**Filed Jul. 7, 1982, Ser. No. 395,973**

**Claims priority, application United Kingdom, Jul. 16, 1981, 8121999**

**Int. Cl.³ E21D *23/16***

**U.S. Cl. 405—302** **3 Claims**




3. An assembly of mine-roof supports of which

(i) each has hydraulically-operated means, the assembly of hydraulically-operated means, in use, being operated one after the other in a predetermined sequence,

(ii) each of some at least has a control member actuable to cause operation of the hydraulically-operated means of other mine-roof supports, and

(iii) each, other than that having the first hydraulically-operated means to be operated in the predetermined sequence, has associated with it hydraulic control means

(a) normally to prevent operation of a hydraulically-operated means in response to actuation of a control member, but

(b) operable, in response both to the completion of operation of the next-before hydraulically-operated means in sequence and to the de-actuation of the control member which caused operation of that next-before means, to permit operation of the next-to-operate hydraulically-operated means in the sequence when a control member is next actuated, and

(c) comprising a first pressure-operated hydraulic control valve and two further serially-connected pressure-operated hydraulic control valves, one of the two being responsive to the completion of operation of the next-before hydraulic means in the sequence to permit the flow of fluid to the second of the two, and the second being responsive to the deactuation of the control member which caused operation of the next-before hydraulic means in the sequence to permit the flow of said fluid to the first pressure-operated hydraulic control valve.

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**4,422,809**

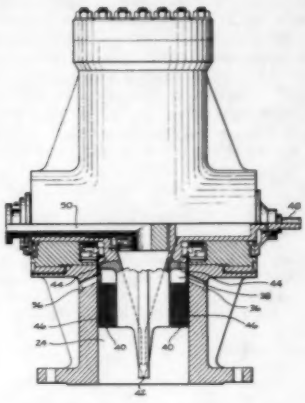
## COAL PUMP

**John H. Bonin, Sunnyvale; John W. Meyer, Palo Alto, and Arnold D. Daniel, Jr., Alameda County Fairgrounds, all of Calif., assignors to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.**

**Continuation of Ser. No. 036, 843, May 7, 1979, abandoned. This application Jun. 15, 1981, Ser. No. 273,606**

**Int. Cl.³ B65G *53/40***

**U.S. Cl. 406—98** **8 Claims**



1. Apparatus for feeding pulverized material from a supply source to a high pressure accumulator, comprising:

(a) a high pressure housing,

(b) feed means for supplying pulverized material,

(c) extruder means disposed in the housing and connected to the feed means for receiving the pulverized material and discharging it at high pressure within the housing,

(d) said extruder means having a central rotating hub and a plurality of radially extending sprues each terminating with a discharge outlet which rotate therewith,

(e) all of the sprues disposed within a common rotating plane perpendicular to the rotating hub, and

(f) gas pressurizing means disposed within the housing on said rotating hub adjacent the sprues for directing high pressure gas parallel to and adjacent the plane in which the sprues are disposed.

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**4,422,810**

## APPARATUS FOR TRANSPORTING PNEUMATICALLY SUSPENDED PARTICULATES FROM A SOURCE TO A PLURALITY OF RECEIVERS

**Douglas J. Boring, Franklin, Pa., assignor to Conair, Inc., Franklin, Pa.**

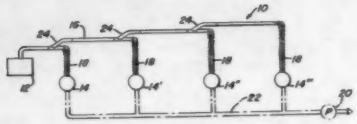
**Filed Dec. 20, 1978, Ser. No. 971,344**

**Int. Cl.³ B65G *53/26, 53/52***

**U.S. Cl. 406—156** **8 Claims**

1. A vacuum conveying system for transporting pneumatically suspended particulates from an upstream particulate source to a plurality of downstream particulate receiving means comprising: a continuous primary material transport conduit having a plurality of elongated generally horizontally

extending conduit portions with each downstream extent of said conduit portions being spaced below the adjacent upstream extent of the downstream adjacent one of said conduit portions; said primary material transporting conduit having adjacent ones of said conduit portions connected by transition conduit portions, respectively, a plurality of particulate receiving means, branch conduits communicating between said particulate receiving means and said conduit portions downstream of the upstream section of said transition conduit portions, respectively; vacuum producing means for obtaining a vacuum



in a selected one of said particulate receiving means whereby pneumatically suspended particulate from such a source are transporatable by suction to said selected one of said particulate receiving means; and each of said transition portions extending at an upward acute angle with respect to the central axis of the downstream conduit portion of said conduit portions connected thereby to inhibit the flow of particulate therethrough when said vacuum producing means discontinues the vacuum to said selected one of said particulate receiving means.

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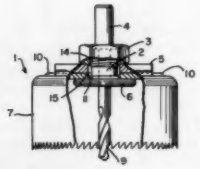
**4,422,811**

## HOLE SAW

**Bruce Ellison, Leeds, and James A. DeCarteret, Bernardston, both of Mass., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.**

**Filed Jan. 16, 1981, Ser. No. 225,849**
**Int. Cl.³ B23B *51/04***
**U.S. Cl. 408—204** **2 Claims**



1. A hole saw comprising:

a mandrel;

a hole saw blade disposed on said mandrel for rotation with said mandrel about the mandrel axis;

a drive washer disposed on said mandrel for rotation with said mandrel about the mandrel axis;

a mandrel nut disposed on said mandrel to secure said hole saw blade and said drive washer to said mandrel;

said hole saw blade and said drive washer are provided with cooperation drive means for driving said hole saw blade;

said mandrel is provided with a backing land at its one end and a drive shank at its other end;

said hole saw blade abuts said backing land;

said driver washer abuts said hole saw blade;

said mandrel nut abuts said drive washer;

said mandrel nut is secured to said mandrel by means of a left hand thread; and

said cooperating drive means are elongated radially extending ribs on one of said hole saw blade and said drive washer and coacting elongated radially extending depressions on the other of said hole saw blade and said drive washer said hole saw blade and said drive washer which serving to drive said hole saw blade and further serving as stiffening means for said hold saw blade.

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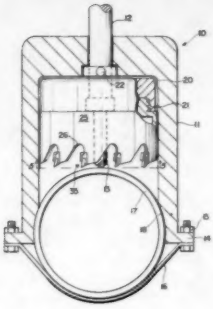
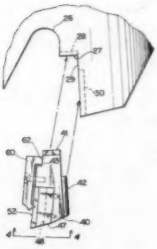
**4,422,812**

## ROTATABLE SHELL CUTTER

**Kevin D. Linville, 6237 Sturm Rd., Huntington, W. Va. 25705**

**Filed Nov. 25, 1981, Ser. No. 324,993**
**Int. Cl.³ B23B *27/10***
**U.S. Cl. 408—204** **12 Claims**





1. A rotatable shell cutter of the type intended for cutting an opening into the curved side surface of an elongated pipe, generally transverse to the direction of elongation of the pipe, comprising:

a cylindrical member having an operative end, at least three cutting assemblies arranged in a circle at the operative end of the cylindrical member, to cut into the side of the pipe as the cylindrical member is advanced parallel to its axis,

a rotatable drill bit located along the axis of the cylindrical member and rotatable therewith to drill a hole into the side of the pipe as the cutting assemblies of the cylindrical member are cutting an opening into the side of the pipe,

a circumferentially extending recess formed into the operative end of the cylindrical member adjacent each cutting assembly, the side of each recess, on the trailing side thereof, taken in the direction of rotation, having first locating means therein, which first locating means is longer in the axial direction of the cylindrical member than in the circumferential direction thereof,

a seat operatively mounted so as to be supported by said first locating means, said seat being elongated in a direction parallel to the axis of the cylindrical member, such that a major portion of the rear of the seat, taken in the direction of travel of the cylindrical member, is supported by the axially extending part of said first locating means, said seat being removably mounted relative to said cylindrical member,

a cutting insert being elongated and having a cutting edge at the end thereof extending axially out from said operative

end of the cylindrical member, the elongated trailing side of the cutting insert resting against the seat,

second locating means on the insert and seat for locating the cutting insert against and relative to the seat,

and a clamp having first means removably connected relative to the cylindrical member, said connection being beyond the ends of the seat and cutting insert, which ends are remote from the cutting edge of the latter, and said clamp having second means engaging the cutting insert to positively and removably position the cutting insert relative to the seat and the cylindrical member, and to secure the cutting insert and seat relative to the cylindrical member.

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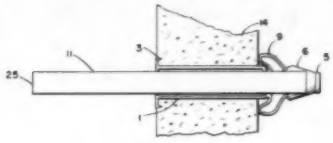
**4,422,813**

## WALL EXPANSION DEVICE WITH ANCHORING SOCKET

**Sheldon Greenbaum, 11651 Stoneview Sq., Reston, Va. 22091**

**Filed Mar. 5, 1981, Ser. No. 240,625**
**Int. Cl.³ F16B *13/06***
**U.S. Cl. 411—38** **4 Claims**



1. A device for securing an object to a hollow wall surface comprising a first hollow tube member having wall-engaging means at one end, a second hollow tube member having a plurality of longitudinally extending slots spaced about its outer surface, means for removably fastening the other end of said first member to one end of said second member in longitudinal alignment of said members for insertion into an opening through said wall surface, the interior surface of said other end of said second member being provided with threads for receiving a threaded portion of a fastening member extending longitudinally through said joined hollow members, a portion of said second tube member adjacent said threaded end tapering inwardly toward said threaded end, said second member being adapted to collapse radially outwardly along said slots and into contact with the adjacent wall surface as a fastening member is threaded through said threaded end of said second member, said second member being capable of being unfastened from said first member by means extending through said longitudinally aligned hollow members and engaging the inner wall surface of said tapered portion with a force sufficient to unfasten said second member from said first member and cause said second hollow member to fall within said hollow wall.

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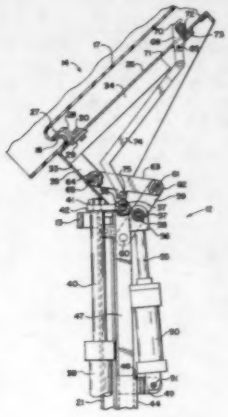
**4,422,814**

## GROUND LEVEL DUMP UNIT

**Ernest D. Borders, Statesville, N.C., assignor to Applied Products, Inc., Statesville, N.C.**

**Filed Jun. 2, 1981, Ser. No. 269,467**
**Int. Cl.³ B65G *65/30***
**U.S. Cl. 414—303** **6 Claims**

1. A dumping unit for lifting and dumping a waste receptacle into a compactor, comprising a frame mounted on the compactor, laterally spaced vertical slide bars slidably mounted on said frame, a fluid cylinder on said frame for raising said slide bars, a face plate assembly pivoted on the upper ends of said slide bars and having a support saddle at its upper end, a second fluid cylinder mounted on the lower ends of said slide bars, linkage means connecting said face plate and said second cylinder to rotate said face plate and invert a receptacle supported on said saddle to dumping position, a hook lever pivoted on said face plate assembly and adapted to engage an abutment on said receptacle to lock it in inverted dumping position, and a bell crank link connecting said hook lever to said linkage



means to move the hook lever into engagement with said abutment as the face plate assembly is rotated to invert the receptacle.

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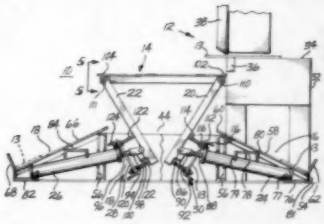
**4,422,815**

## MACHINE TOOL SUPPORT AND DISCHARGE APPARATUS

**Bernard Danhof, Bellevue, Wash., assignor to Western Automation Corporation, Redmond, Wash.**

**Filed Jan. 4, 1982, Ser. No. 336,635**
**Int. Cl.³ B65H *35/00***
**U.S. Cl. 414—222** **58 Claims**



47. A double tilting support and discharge apparatus, comprising:

(a) a table portion;

(b) first support leg means having an upper end portion pivotally connected to said table portion at a first pivot axis;

(c) second support leg means having an upper end portion pivotally connected to said table portion at a second pivot axis spaced from said first pivot axis;

(d) first actuator means pivotally supporting the lower end portion of said first leg means, said first acutator means pivoting said table portion about said second axis by shifting said first actuator means between a retracted position and an extended position; and

(e) second actuator means pivotally supporting the lower end portion of said second leg means, said second actuator means pivoting said table portion about said first pivot axis

by shifting said second actuator means between a retracted position and an extended position.

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**4,422,816**

## SHIFTABLE ARTICLE STORAGE DEVICE

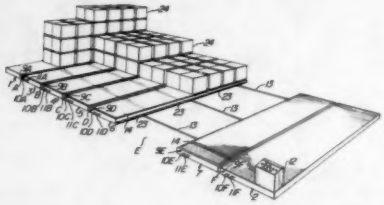
**Han-Ichiro Naito, Akishima; Tsuneo Yamaguchi, Tokyo, and Kiyoshi Harashima, Ome, all of Japan, assignors to Elecompack Company Ltd., Tokyo, Japan**

**Filed Mar. 16, 1971, Ser. No. 124,726**

**Claims priority, application Japan, Mar. 17, 1970, 45-22501; Jun. 14, 1970, 45-61662; Jun. 29, 1970, 45-56748; Dec. 28, 1970, 45-125408**

**Int. Cl.³ A47B *53/00***

**U.S. Cl. 414—331** **7 Claims**



1. In a shiftable storage means including a plurality of movable stacks, supporting means for each of said stacks, including a reversible electric motor and two relay means for each of said stacks for controlling the direction of the motors and stacks, and a plurality of safety switches secured to the sides of each movable stack for cutting off the current to the motors when the stacks move too close to each other; the improvement which comprises: a normally open pair of relay contacts mounted on one of said relay means for completing a bypass circuit around a safety switch on an adjacent stack for permitting both stacks to be moved in unison in a desired direction to open a space between stacks.

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**4,422,817**

## LOAD MANIPULATING APPARATUS

**Frank Little, Au Gres, Mich., assignor to The Harshaw Chemical Company, Cleveland, Ohio**

**Filed May 29, 1981, Ser. No. 268,622**

**Int. Cl.³ B65G *65/23***

**U.S. Cl. 414—421** **12 Claims**

1. A load manipulating apparatus comprising:

(a) a turnplate assembly rollingly engaging a base means and supported for rotation about an upstanding shaft by a bearing means;

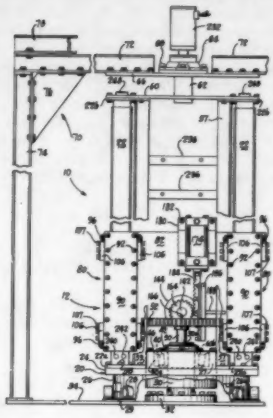
(b) a pair of columns attached to and extending upwardly from said turnplate assembly;

(c) turnplate drive means carried by said turnplate assembly, engaging said shaft for effecting rotation of said turnplate assembly, said turnplate drive means rotating with said turnplate assembly;

(d) an elevator guided for vertical, reciprocating movement along said columns;

(e) elevator drive means coactable with drive structure formed on said columns for effecting movement in said elevator;

(f) an operating arm attached to said elevator for engaging a load, including means for releasably engaging a parts receptacle, said parts receptacle comprising a hopper including a pair of spaced, apertured ears engageable by fluid pressure actuated pins carried by said operating arm; and,



(g) arm tilt means for pivoting said arm about a horizontal axis.

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**4,422,818**

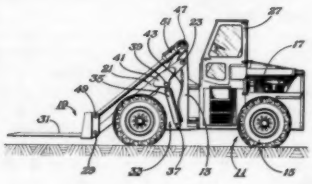
## SCRAPPER TYPE VEHICLE

**Lloyd A. Molby, P.O. Box 7788, Longview, Tex. 75602**

**Continuation of Ser. No. 162,376, Jun. 23, 1980, abandoned. This application Aug. 16, 1982, Ser. No. 408,684**

**Int. Cl.³ B66F *9/00***

**U.S. Cl. 414—712** **3 Claims**



1. In a scrapper type vehicle for handling junk cars and the like and having a frame mounted on wheels and having a prime mover powering the vehicle, the improvement comprising:

a. a pair of main beams attached at respective inner end portions to a pair of respective first points on said frame for pivotal movement about a first transverse, horizontal axis thereat;

b. a lifting fork means pivotally attached to said main beams at their respective outer ends at a pair of respective second points and having lift prongs adapted to penetrate laterally through said junk cars to lift said junk cars and to load said junk cars onto a transport vehicle;

c. elevating means connected with said main beams and said frame for elevating said outer ends of said main beams and said lift prongs with any junk car thereon; and

d. lift fork tilting means attached to said frame at a pair of respective third points for pivotal movement about a second transverse, horizontal axis thereat; said lift fork tilting means being pivotally attached to said lift fork means at a pair of respective fourth points; said lift fork tilting means including extensible and retractable means that can be locked into a given length for fixing an angle of tilt to said lift fork means, that said lift fork tilting means can be locked into a parallelogram linkage with said main beams with said lifting fork means at neutral tilt and that

said lift fork tilting means can be varied into trapezoidal configurations with said main beams at other angles of tilt of said lifting fork means when positioned either upward or downward from the neutral tilt;

said pair of first and third points being disposed vertically with respect to each other and at the same angle and in the same respective direction that said pairs of said second and fourth points are disposed with respect to each other when said lift fork prongs are substantially horizontal in said neutral tilt such that said lift fork means can be moved from ground level to maximum height with the neutral tilt maintained by only raising said outer ends of said main beams because of said parallelogram linkage at said neutral tilt.

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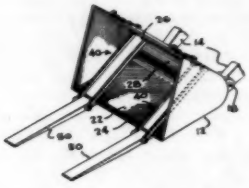
**4,422,819**

## FOLD-AWAY FORK LIFT FOR LOADERS

**William H. Guest, Torrington, Conn., assignor to Guest Industries, Inc., Torrington, Conn.**

**Filed Apr. 21, 1981, Ser. No. 256,245**
**Int. Cl.³ E02F 3/70**
**U.S. Cl. 414—724** **33 Claims**



**14**. In combination with a front end bucket having a bottom plate with a lip, an upper inclined plate and adjoining plate means between the said plates, a fork lift attachment comprising:

a tine, and

means comprising a support arm for mounting said tine for movement between a first, use position wherein said tine extends forwardly of the front lip of the bucket and a second, storage position in which said tine extends along the underside of said upper plate.

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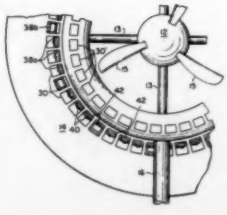
**4,422,820**

## SPOILER FOR FLUID TURBINE DIFFUSER

**Jerome Kirsch, Dix Hills, and Edward Markow, Oakdale, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.**

**Filed Sep. 29, 1982, Ser. No. 427,622**
**Int. Cl.³ F03D 7/04**
**U.S. Cl. 415—4** **11 Claims**



**1**. A fluid-energy device having a passively limited power output, said device comprising:

a duct with an inlet, an outlet of greater cross sectional area than the inlet, and at least one slot for conducting external fluid to a boundary layer along an inner surface of the duct between the inlet and the outlet;

a rotatable turbine mounted within the duct between the outlet and the inlet; and

at least one tab mounted to the duct so as to have a preload position in which fluid flow through the slot is relatively unimpeded and an attenuating position in which the slot is at least partially blocked, said tab having a lifting surface arranged such that fluid flow through the slot causes a decrease in pressure against the lifting surface.

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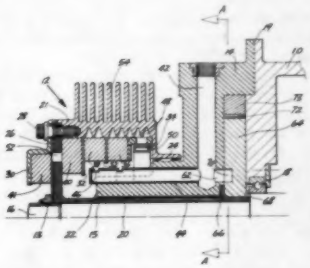
**4,422,821**

## FLUID PROCESSING DEVICE

**Stanley Smith, Wotton-under-Edge, England, assignor to Rolls Royce Limited, London, England**

**Filed Dec. 22, 1980, Ser. No. 218,704**
**Claims priority, application United Kingdom, Dec. 21, 1979, 7944038**
**Int. Cl.³ F04D 11/00**
**U.S. Cl. 415—89** **4 Claims**



**1**. A separator for a fluid mixture which contains both a liquid and a gas, comprising:

a body having a static part and a rotatable part and drive means for causing rotation of the rotatable part thereof;

at least three axially separated annular compartments within the rotatable part of the body, a first and a second one of said compartments each having one inlet and separate liquid and gas outlets therefrom, and each containing a rigid fluid-permeable material connected for rotation with the body and disposed between the inlet and one of said outlets, the third of which has one inlet and one outlet and contains a static scoop; and,

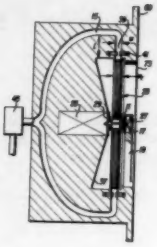
means for directing fluid mixture to be separated into the inlet of the first compartment at a radially inner part thereof,

the arrangement being such that the mixture flows into the fluid-permeable material in the first compartment, the liquid flowing radially outwardly under centrifugal action through the material to the liquid outlet at a first radius through which it passes into the third compartment to be picked up and delivered from the device by the scoop the entry to which is disposed at a second radius less than the first radius, the gas leaving the material at a third radius less than the second radius, and passing to the inlet of the second compartment which is disposed at a radially outer part thereof at a radius less than the second radius, the gas passing radially inwardly through the fluid-permeable material in the compartment to a clean gas outlet while any liquid carried in the fluid-permeable material by the gas is centrifuged to a liquid outlet in the radially outer part of the compartment which also communicates with the inlet of the third compartment.

## 4,422,822
## ROTATING FIBER ARRAY MOLECULAR DRIVER AND MOLECULAR MOMENTUM TRANSFER DEVICE CONSTRUCTED THEREWITH

Norman Milleron, 1854 San Juan, Berkeley, Calif. 94707

Filed Aug. 11, 1980, Ser. No. 176,971
Int. Cl.³ F01D *1/34*
U.S. Cl. 415—90 20 Claims



1. A molecular vacuum pump for evacuating gaseous molecules from a chamber containing said molecules comprising:

a housing;

a first rotor mounted in said housing and including a first central hub and a plurality of fibers attached to and about the outer circumference of said hub, said fibers at the point of attachment to said hub being normal to said outer circumference and extending in a radial direction from an axis of said hub;

a molecule inlet provided in said housing and connecting with said chamber for establishing a path for molecules to flow from said chamber into said rotor;

means for rotating said rotor about its axis at a predetermined speed sufficient to axially extend and straighten said fibers and provide the ends of said fibers with a tip speed which equals or exceeds the average velocity of gaseous fluid molecules entering said rotor such that molecules struck by the sides of the ends of said fibers are propelled from a point radially outward of the hub where they are struck in a direction defined by a distribution function which peaks in a direction normal to the sides of said fibers and in the direction of fiber rotation;

an annular molecule exit path provided in said housing and surrounding said first rotor, said annular molecule exit comprising at least one exit slot spaced from the ends of the rotating fibers extending radially and annularly about the axis of said hub and receiving molecules struck by said rotor fibers;

a molecule discharge path connected to said annular molecule exit path; and

means for magnetically suspending said rotor when said rotor is rotating at said predetermined speed.

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## 4,422,823
## TURBODRILL

Rolen A. Ioannesian, naberezhnaya Tarasa Shevchenko, 1/2, kv. 19, and Jury R. Ioanesian, Matveevskaya ulitsa, 18, korpus 2, kv. 63, both of Moscow, U.S.S.R.

Continuation of Ser. No. 855,544, Nov. 29, 1977, abandoned.
This application Jun. 29, 1981, Ser. No. 278,395
Int. Cl.³ F01D *15/06*
U.S. Cl. 415—199.5 17 Claims

1. A turbodrill comprising:

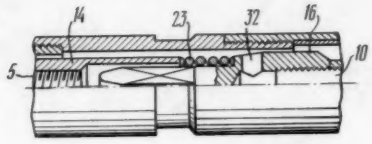
a casing;

a multistage turbine in said casing having a plurality of stators and a plurality of rotors, said stators being mounted to and rigidly fixed to said casing;

a sectional shaft composed of a plurality of releasably connected neighboring shafts, each said connected shaft having a separate one of said rotors mounted thereto;

first ball bearing means for each said neighboring shaft comprising ball bearings disposed between said casing and each said neighboring shaft separately to said casing;

connecting means operating to releasably connect said releasably connected shafts serially to one another and being operable to permit relative displacement therebetween at the releasable connection, said connecting means comprising slide couplings formed by a female and a male half-couplings, said half-couplings have a cross-section to compensate for misalignment of neighboring shafts;




a spindle assembly mounted to one end of said sectional shaft and including a spindle shaft operable to rotatably drive a drilling bit;

hydraulic damping means forming part of said slide couplings operably disposed between said sectional shaft and said spindle shaft and including an interstice in said female half-coupling, said interstice communicating with the space between the casing of the turbodrill and the shaft thereof and a sealing element placed in the male half-coupling; and

second ball bearing means disposed between said casing and said spindle assembly, and rotatably mounting said spindle assembly in said casing.

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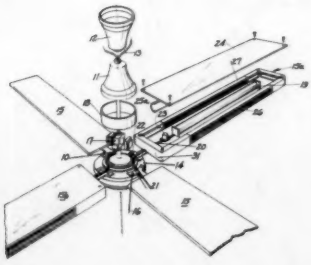
## 4,422,824
## GERMICIDAL CEILING FAN BLADE

Charles A. Eisenhardt, Jr., 1051 Sugar Sands Blvd., Riviera Beach, Fla. 33404

Filed Mar. 29, 1982, Ser. No. 363,260
Int. Cl.³ F04D *29/70*
U.S. Cl. 416—5 16 Claims

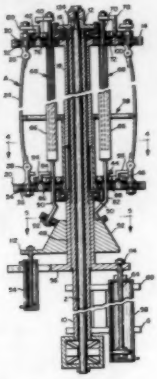


1. A fan blade comprising: a hollow housing having leading and trailing edges through which air may pass; a germicidal light located within said housing; and means to insure that said light will burn as the fan blade rotates.

## 4,422,825
## CONTROLLED WIND MOTOR

**Fred A. Boswell, Box 440, Ft. Valley Rte., Strasburg, Va. 22657**

**Continuation-in-part of Ser. No. 131,666, Apr. 29, 1980, abandoned. This application Apr. 22, 1982, Ser. No. 370,627**
**Int. Cl.³ F03D** *7/06*
**U.S. Cl. 416—132 B** **7 Claims**



1. A mechanical sail including:
(a) a mast including a rotatably drive shaft and a nonrotatable sleeve surrounding said drive shaft,
(b) a top vane mount and a bottom vane mount rotatably connected to said mast,
(c) said mounts spaced from each other on said mast,
(d) a series of rotatable vanes spaced from and surrounding said mast and supported by and between said mounts,
(e) means extending between said mounts and connected to said vanes for controlling the rotation of said vanes including cam means,
(f) first piston operator means for said cam means associated with said mast below said bottom vane mount,
(g) said first piston operator means being movable vertically with respect to said mast,
(h) second piston operator means for moving said first piston operator means vertically with respect to said mast,
(i) said vanes being flexible and bowed outwardly,
(j) said bottom vane mount being movable vertically with respect to said mast and connected to said second piston operator means,
(k) whereby when said second piston operator means is operated, said bottom vane mount will move toward said top vane mount causing said vanes to bow outwardly at a desired arc, and
(l) whereby when said first piston operator means is moved, said vanes are caused to rotate to the desired angle of attack with respect to wind velocity and direction.

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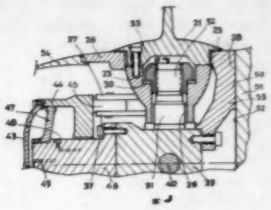
## 4,422,826
## PROPELLER RUNNER HAVING SWIVELLING BLADES FOR TURBINES

**Severin Casacci, La Tronche, and Paul Jarriand, Grenoble, both of France, assignors to Neyrpic, Grenoble, France**

**Filed Apr. 8, 1981, Ser. No. 252,101**
**Claims priority, application France, Apr. 24, 1980, 80 09243**
**Int. Cl.³ F03B** *3/06*
**U.S. Cl. 416—157 R** **3 Claims**

1. A propeller runner having four swivelling blades radially mounted in a hub, each said blade having at its root spaced, coaxial first and second cylindrical bearing surfaces defining the axis of rotation of said blade about itself, this rotation being intended for governing the angle of incidence of said blade, lateral connecting rods on each blade the movement of which is controlled simultaneously by means internal to said runner so as to regulate jointly the angle of incidence of all of said blades, said first cylindrical bearing surface of each blade being engaged in a bearing formed in the outer portion of said hub, said second cylindrical bearing surface of each blade being engaged around a cylindrical journal, each said journal being rigidly and radially fixed around a central core which in turn is rigidly



connected to a portion of said hub extending towards the center, said core carrying two diametrically opposite journals, a shaft passing through said core perpendicularly to the axis of said two journals, said shaft being locked in said core and having two ends which constitute two further journals, each said journal forming an axial thrust bearing for the corresponding blade.

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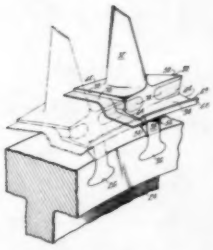
## 4,422,827
## BLADE ROOT SEAL

**Paul M. Buxe, Lake Park; James F. Marshall, and Paul A. Smith, Jr., both of Palm Beach Gardens, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Feb. 18, 1982, Ser. No. 349,747**
**Int. Cl.³ F01D** *5/30*
**U.S. Cl. 416—193 A** **4 Claims**



1. A rotor assembly and adjacent static structure for a gas turbine engine comprising:
a disk having a plurality of axially extending blade receiving slots around its periphery; and
a plurality of rotor blades each including a platform, an airfoil, and a root having a base portion and a neck portion, said platform, airfoil, and root being of one-piece construction, said base portion of one of said rotor blades being disposed in each of said slots, said neck portion extending radially outwardly from said base portion to said platform and having an upstream and downstream end and laterally facing side surfaces spaced apart from the side surfaces of adjacent blade root neck portions, said airfoil extending radially outwardly from said platform, each platform having an underside surface and an axially extending first edge on each side of said airfoil, each first edge substantially abutting a corresponding first edge of the platform of an adjacent blade, each blade including a seal segment integral with one of said ends of said neck portion and projecting axially away from said end and

spaced radially inwardly from said platform and radially outwardly from said base portion, said seal segments each having an axially extending second edge on each side of said neck portion substantially abutting a corresponding second edge of an adjacent blade, said segments defining a first segmented annular ring, each segment having an underside surface, said first ring cooperating with said static structure to define a first annular seal, each blade also including air dam means extending laterally from each of said neck portion side surfaces to said edges of said platform and seal segment and extending radially from said platform to said seal segment, said dam means of adjacent blades substantially abutting each other to define a second annular seal, said abutting edges of said platforms and seal segments, and said abutting dam means defining a line of abutment between each pair of adjacent blades along said underside surfaces of said abutting platforms and abutting seal segments, said rotor assembly also including a thin silicone rubber strip overlying the full axial length of said line of abutment to reduce leakage between said abutting edges, each strip being bonded to at least one of said blades.

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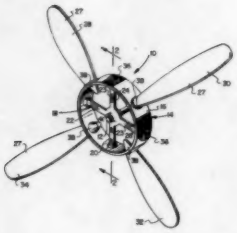
**4,422,828**

## METHOD OF AND APPARATUS FOR INCREASING PROPULSIVE EFFICIENCY OF AIRCRAFT PROPELLERS

**Kenneth W. Sambell, 3412 Little Rd., Arlington, Tex. 76016**

**Filed Oct. 9, 1981, Ser. No. 310,284**
**Int. Cl.³ B64C *11/12, 11/40***
**U.S. Cl. 416—135** **5 Claims**



1. An improved aircraft propeller assembly for fixed wing aircraft of the type comprising an array of generally vertically oriented propeller blades secured about a generally horizontal propeller drive shaft driven by an engine secured to the wing of an aircraft, wherein the improvement comprises,

a beamwise flapping flexure array secured radially about the drive shaft for providing beamwise flapping relative to the drive shaft and providing blade rigidity in radial torsional and inplane directions relative thereto;

a cylindrical hub flexibly mounted to said flexure array symmetrically around said drive shaft;

said hub being mounted to said flexure by a pivot pin joint having a longitudinal axis of symmetry substantially within the plane of rotation of the said flexure array and tangential to a circle drawn in said plane;

said propeller blades being mounted symmetrically to said hub; and

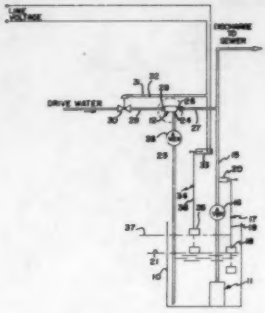
said flexures constructed for permitting beamwise flapping of said hub and propeller array in response to generally horizontal wind loading of said propellers.

**4,422,829**

## SUMP DRAIN SYSTEM

**William T. Buchanan, 32 Hamilton La., Oak Brook, Ill. 60521**

**Filed Feb. 25, 1982, Ser. No. 352,361**
**Int. Cl.³ F04F *5/48***
**U.S. Cl. 417—40** **5 Claims**



1. A drain system for a sump disposed in a dwelling supplied with electrical power and municipal water,

said system comprising a first pump energizable by said electrical power,

and a second pump energizable by said municipal water,

first means causing said first pump to be energized and drain the sump in response to the water rising to a first predetermined level, and

second means causing said second pump to be energized and drain the sump immediately upon a failure of said electrical power, said second means further causing said second pump to be energized and drain the sump upon the water rising to a second predetermined level higher than said first predetermined level.

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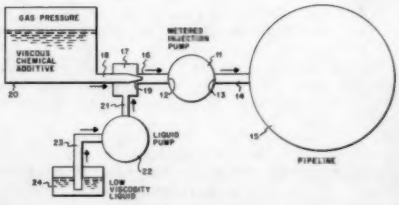
**4,422,830**

## PERFORMANCE OF A PIPELINE ADDITIVE INJECTION SYSTEM

**Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.**

**Filed Dec. 14, 1981, Ser. No. 330,113**
**Int. Cl.³ F04F *5/12***
**U.S. Cl. 417—54** **5 Claims**




1. In an additive injection method wherein a viscous chemical liquid in a container is pumped in a metered and controlled amount through an inlet line to the suction side of a metering injection pump and thence through the discharge side of said metering injection pump into a pipeline liquid flowing in a pipeline, the improvement comprising injecting a relatively low viscosity liquid into the said inlet line, said low viscosity liquid being compatible with said pipeline liquid, and operating said metering injection pump in a manner such that the rate of throughput of said metering injection pump exceeds the rate at which said low viscosity liquid is pumped into said inlet line

and in a manner such that the amount of said chemical liquid pumped into said pipeline liquid is metered and controlled.

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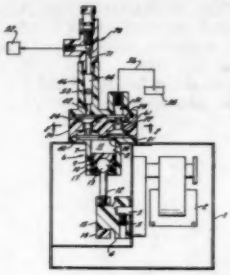
4,422,831

## PUMP

Rolyn A. Schmid, Hayward, Wis., assignor to Bender Machine Works, Inc., Hayward, Wis.

Filed Nov. 2, 1981, Ser. No. 317,168
Int. Cl.³ F04B 21/00, 39/00
U.S. Cl. 417—63 2 Claims



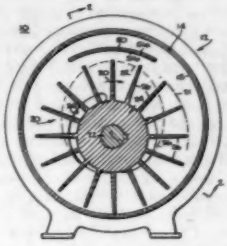
1. A self-priming adjustable output pump assembly for supplying liquid from a source of supply either into a pressurized vessel maintained at some greater pressure greater than atmospheric or to atmosphere comprising: a piston type pump including a pumping chamber and a piston reciprocable therein, said pumping chamber having an inlet port and a discharge port at the upper end thereof, said discharge port being connected to a discharge passage which is connectable to said pressurized vessel or to atmosphere, means for reciprocating said piston in said pumping chamber to effect pumping and suction strokes, said pumping chamber having a maximum volumetric capacity at the end of a suction stroke and a minimum volumetric capacity at the end of a pumping stroke, a valve assembly including a one-way inlet valve for permitting one way flow of fluid from said source of supply through said inlet port into said pumping chamber during a suction stroke and also including a one-way discharge valve for permitting one-way flow of fluid from said pumping chamber through said discharge port to said discharge passage during a pumping stroke, a discharge chamber located between said discharge valve and said discharge port of said pumping chamber, the volumetric capacity of said discharge chamber being equal to or greater than the minimum volumetric capacity of said pumping chamber whereby any air that is drawn into said pumping chamber rises to the top thereof and is discharged through said discharge port, through said discharge chamber, through said discharge valve and through said discharge passage prior to liquid being discharged therethrough to thereby prevent air from accumulating in said pumping chamber and maintaining said pump in a primed condition, and means to vary the liquid flow from said pump comprising a by-pass passage communicating between the inlet side of said inlet valve and said pumping chamber and an adjustable by-pass valve for varying the amount of liquid flow through said by-pass passage from said pumping chamber to said inlet side of said inlet valve during a pumping stroke of said piston when liquid is being supplied to said pressurized vessel, said means further comprising an adjustable output valve for varying the amount of liquid flow through said discharge passage to increase fluid pressure therein to effect liquid flow from said pumping chamber through said by-pass passage to said inlet side of said inlet valve during a pumping stroke of said piston and thereby render said by-pass valve operative when liquid is being supplied to atmosphere.

4,422,832

## LIQUID RING PUMP WITH VANES IN LIQUID RING

Harold K. Hasvik, South Norwalk, Conn., assignor to The Nash Engineering Company, Norwalk, Conn.

Filed Oct. 23, 1981, Ser. No. 314,388
Int. Cl.³ F04C 19/00
U.S. Cl. 417—68 15 Claims



1. In a liquid ring pump including an annular housing; a rotor rotatably mounted within the housing so that it is eccentric to at least a portion of the annular housing, the rotor having a plurality of radially extending blades; and a quantity of pumping liquid maintained in the housing so that it is engaged by a portion of each rotor blade at all times during operation of the pump and forms an annular ring around the inner periphery of the housing when the rotor is rotated, the improvement comprising:

at least one vane mounted relative to the housing and disposed in the liquid ring with at least one axis of each major surface of the vane substantially parallel to the rotational axis of the rotor, the vane being located in the liquid ring so that a substantial portion of the liquid in the liquid ring outside the outer periphery of the rotor flows past the vane on each side of the vane at all times during operation of the pump to reduce energy losses due to turbulence in the liquid ring.

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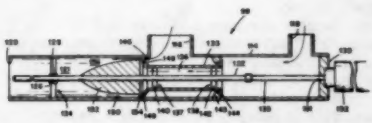
4,422,833

## PNEUMATIC TRANSFER SYSTEM AND A FLUID FLOW CONTROL DEVICE THEREFOR

David L. W. Miller, Knoxville, and Billy P. Freeman, Blaine, both of Tenn., assignors to Free Flow, Inc., Blaine, Tenn.

Filed May 11, 1981, Ser. No. 262,121
Int. Cl.³ F04F 5/20, 5/52
U.S. Cl. 417—183 11 Claims



1. A fluid control device, comprising:

means defining a first fluid flow passageway;

means defining a fluid inlet into said first fluid flow passageway;

means defining a fluid outlet from said first fluid flow passageway;

means defining a second fluid flow passageway mounted for movement between a first position and a second position, said second fluid flow passageway being in fluid communication with said first fluid flow passageway when said second fluid flow passageway is in the first position and when said second fluid flow passageway is in the second position;

means defining a fluid flow-through aperture in fluid flow communication with said second fluid flow passageway;

means adapted to define an annular restricted flow area in said first passageway when said second fluid flow passageway is in the first position so that fluid flowing in said first fluid flow passageway from said fluid inlet toward said fluid outlet flows through said annular restricted flow area and is accelerated creating a low pressure zone at the location of flow communication between said first and second fluid flow passageways to induce fluid flow from said flow-through aperture through said second fluid flow passageway and into said first passageway;

said annular restricted flow area defining means being removed from cooperation with said first fluid flow passageway defining means when said second fluid flow passageway is in the second position so that the low pressure zone is not created at the location of flow communication between said first and second fluid flow passageways; and

said means defining a second fluid flow passageway being operable when moved to the second position to define at least two flow paths so that fluid flowing into the flow control device through said fluid inlet is divided into at least the two flow paths, one path being through said first fluid flow passageway to said fluid outlet and the other path being through said second fluid flow passageway to said flow-through aperture.

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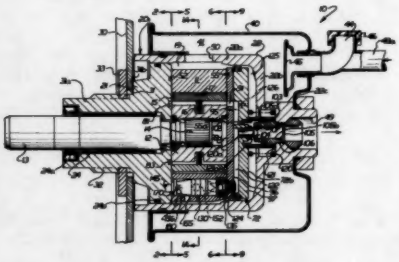
**4,422,834**

## POWER STEERING PUMP

**Gilbert H. Drutchas, Birmingham, and David J. Suttkus, Utica, both of Mich., assignors to TRW Inc., Cleveland, Ohio**

**Filed May 7, 1981, Ser. No. 261,643**
**Int. Cl.³ F04B 49/08**
**U.S. Cl. 417—283** **12 Claims**



1. A pump for supplying fluid from a reservoir to a system comprising

a rotor member,

a cam member encircling said rotor member,

means for effecting relative rotation of said cam and rotor members about an axis,

a plurality of vanes carried by one of said cam and rotor members, said vanes engaging the other of said members and defining pumping pockets which expand and contract on relative rotation of said members,

a cheek plate extending radially of the rotational axis and disposed adjacent one side of said rotor member and said cam member, said cheek plate being movable along the rotational axis to communicate expanding and contracting pockets,

means defining a cavity on one side of said cheek plate,

a first fluid passage conducting fluid pressure into said cavity which fluid pressure biases said cheek plate into a position blocking communication between said expanding and contracting fluid pockets,

a servo valve located in said cam member for venting the pressure in said cavity to thereby control the position of the cheek plate,

a second fluid passage, said second fluid passage being in said cheek plate and communicating system pressure to said servo valve so that said servo valve responds to changes in the system pressure,

a third fluid passage, said third fluid passage being through said cheek plate and a portion of said cam ring and communicating said cavity with said servo valve, and

said servo valve having a position blocking said third passage and movable to vent said third passage.

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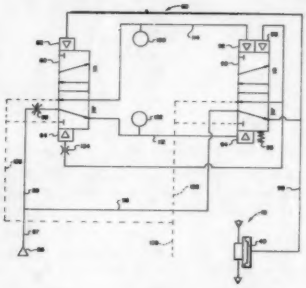
**4,422,835**

## FLUID OPERATED DIAPHRAGM PUMP WITH FLUID TIMING CONTROL AND CONTROL CIRCUIT MANIFOLD MOUNTED ON PUMP BODY

**James E. McKee, Suite 580, States General Life Building, 708 Jackson, Dallas, Tex. 75202**

**Continuation-in-part of Ser. No. 16,185, Feb. 28, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 194,126**
**Int. Cl.³ F04B 43/06**
**U.S. Cl. 417—401** **19 Claims**



8. A fluid operated pump including power piston means and pumping piston means interconnected one with the other, said power piston means being disposed in an expansible chamber and operable in response to pressure fluid being admitted to said chamber to drive said pumping piston means through a pump discharge stroke, means for driving said piston means through a pump suction stroke when said chamber is vented, and a control system for causing said pump to operate through a pumping cycle including a suction stroke and a discharge stroke, said control system comprising:

a first pressure fluid actuated two position valve including first and second fluid actuators for moving said first valve to a first position for conducting pressure fluid from a source to said chamber and a section position for venting said chamber, respectively;

a second pressure fluid actuated two position valve including pressure fluid actuators for moving said second valve between a first position for conducting pressure fluid from said source to actuate said first valve to move to said first position and a second position for conducting pressure fluid from said source to actuate said first valve to move to said second position;

conduit means interconnecting said second valve and said actuators of said first valve for moving said first valve between its first and second positions in response to movement of said second valve; and,

pressure fluid timing means including timing chamber means interposed in said conduit means and means for controlling the flow of fluid to said timing chamber means to selectively delay the movement of said first valve to said first position and said second position in response to movement of said second valve so as to control the frequency of said pumping cycle.

14. A fluid operated pump including a body, a fluid operated

power piston disposed in an expansible chamber formed in said body, and a control system for conducting working pressure fluid to and from said expansible chamber, said control system comprising:

a manifold assembly including a plurality of plates sealingly secured to each other in stacked relationship, said manifold assembly including an inner cover plate and an outer cover plate, said inner cover plate being adapted to be secured in engagement with a mounting face on said pump body, said outer cover plate being adapted to have control valve means mounted thereon, said manifold assembly including an intermediate plate member having at least a first cavity formed therein comprising a pressure fluid timing chamber for said control system.

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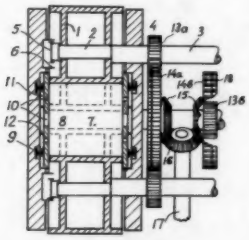
**4,422,836**

## ROTARY MACHINE WITH PERIPHERALLY CONTACTING ROTORS AND END FACE SEALING PLATE

**Usher Meyman, 230 Ocean Pkwy, Apt. E3, Brooklyn, N.Y. 11218**

**Filed Sep. 1, 1981, Ser. No. 298,475**
**Int. Cl.³ F01C *1/02, 17/02, 19/08, 21/00***
**U.S. Cl. 418—56** **13 Claims**



1. A rotary machine, such as a rotary combustion engine and the like, comprising

a plurality of rotors rotatable on eccentric shafts about substantially parallel axes and having peripheral surfaces, said rotors being located relative to one another and each having a shape such that said rotors during the rotation about said axes roll by their peripheral surfaces one over the other without slippage and together bound at least one working cavity which is open at its both axial sides but is permanently closed peripherally by said peripheral surfaces of said rotors;

two covers located at both axial sides of said rotors to close said cavity at the both axial sides;

at least one sealing plate arranged to adjoin one axial end face of said rotors so that it overlaps at least one working cavity, said sealing plate being arranged to form at its side opposite to said rotors a hollow;

means for communicating said hollow with said working cavity so that a working medium flows into said hollow and presses said sealing plate at said opposite side toward and against said end faces of said rotors; and

means for synchronizing rotation of said rotors including gears with inner toothed rims, mounted on at least one of said covers, and gears with outer toothed rims, mounted on said motors and meshing with said gears with said inner toothed rims.

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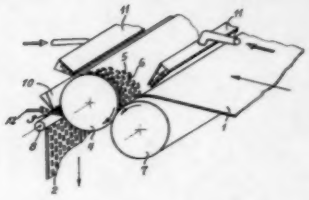
**4,422,837**

## APPARATUS FOR CONVERTING THERMOPLASTIC FILM INTO AN OPEN-WORK SHEET

**Ole-Bendt Rasmussen, 14, Anemonevej, 2820 Gentofte, Denmark**

**Division of Ser. No. 284,685, Jul. 20, 1981, Pat. No. 4,377,544, which is a continuation of Ser. No. 179,708, Aug. 20, 1980, abandoned, which is a continuation of Ser. No. 7,713, Jan. 30, 1979, abandoned, which is a continuation of Ser. No. 841,480, Oct. 12, 1977, abandoned, which is a continuation of Ser. No. 639,007, Dec. 9, 1975, abandoned. This application Sep. 30, 1982, Ser. No. 428,804**
**Claims priority, application United Kingdom, Dec. 10, 1974, 53268/74**
**Int. Cl.³ B29C *17/02*; B29D *27/00***
**U.S. Cl. 425—289** **1 Claim**



1. Apparatus for the direct conversion of thermoplastic film material into open-work sheet material having fibers or threads on one surface thereof, comprising: a continuously advancing surface capable of adhering to said thermoplastic material when the latter is in molten condition, means for selectively heating said advancing surface to a temperature above the melting point of said film material in a pattern of heated surface regions separated by unheated regions, feeding means for progressively bringing one surface of a length of said thermoplastic film material into face-to-face contact with said selectively heated surface and for maintaining said contact for a time sufficient to selectively melt the film material in the areas thereof contacting said heated surface regions, while the remaining film areas remain in generally unmelted and nonadhering condition, and means for progressively separating said film and heated surface whereby said molten film areas by adherence to the contacting heated surface regions are drawn out from the unmelted film areas as filiform projections extending from the surrounding unmelted margins and thereby create apertures in said film generally corresponding to said heated surface regions, and means for directing a flow of cooling air toward the surface undergoing such separation to control the drawing of said filiform projections.

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**4,422,838**

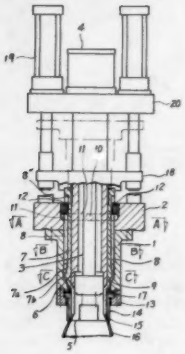
## EXTRUSION HEAD FOR USE IN BLOW MOLDING MACHINE

**Akira Iwawaki; Eiji Horiuchi, both of Yokohama; Sadahiko Shinya, Ninomiya; Kinshiro Kojima, Kawasaki; Katsuo Kodama, Yokohama; Kotaro Kawarata, Yamato, and Hisahiko Fukase, Tokyo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 107,665, Dec. 27, 1979, abandoned. This application Jun. 5, 1981, Ser. No. 270,833**
**Int. Cl.³ B29D *23/04***
**U.S. Cl. 425—376 A** **3 Claims**

1. In an extrusion head for use in blow molding machine having an extruder and supplied with resin wherein an outer periphery of a plunger is in contact with inner walls of a head body and an opening of a support plate, said head body and said support plate being located coaxial with the plunger, and inner periphery of the plunger being in contact with a core

which is positioned coaxially with the plunger, said plunger being slidable in an axial direction, the improvement comprising: a feed port for supplying said resin from the extruder to the head body and being a horizontal hole formed in said support plate above the head body; a sealing block secured to said support plate and having a lower face abutting the upper part of said supply port, the supply port being extended to a lower face of said sealing block, said sealing block being fitted in a longitudinal groove formed axially on the outer periphery of the plunger thereby preventing the resin from remaining in the longitudinal groove in excess of a predetermined time interval when said plunger is slid vertically, said sealing block also preventing the resin from leaking when said plunger is slid vertically; an extended lower part of the longitudinal groove forming a flared portion widening in width in a circumferential



direction of the plunger, a lower part of the flared portion being formed with a throttle which is annular in the circumferential direction of the plunger and shallower than the flared portion, an edge provided on the upper side of said flared portion for scraping off the material adhering to the inner peripheral surface of said head body during each extrusion of material; the side of the throttle portion toward a nozzle being at the lower end of the plunger; an accumulation chamber having a narrow annular flow path between the annular throttle portion and the head body, communicating with the flared portion; and the accumulation chamber being provided with an upper portion surrounded by said annular path and said lower end of the plunger, an outer periphery defined by the inner wall of the head body, an inner periphery defined by the outer wall of the core, and a lower portion extending to the nozzle.

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**4,422,839**

**EXIT DIE**

**Dietmar Przytulla, Sindorf, and Manfred Lehmann, Cologne, both of Fed. Rep. of Germany, assignors to Mauser-Werke GmbH, Bruhl, Fed. Rep. of Germany**

**Filed Nov. 12, 1981, Ser. No. 320,481**

**Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043204**

**Int. Cl.³ B29D *23/04***

**U.S. Cl. 425—465** **8 Claims**

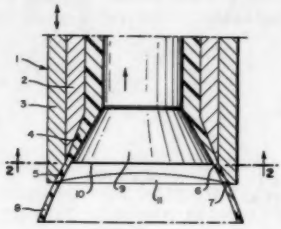
1. In an annular exit die for an extrusion head having a tapered die core and an outer casing ring concentrically disposed around the die core and cooperating with said die core to define an annular die gap for fabricating a hollow extrudate, the die core being tapered radially outwardly as measured in a direction toward the die gap, and wherein the radial width of the die gap varies upon relative axial movement between the die core and casing ring, the improvement wherein the casing ring comprises:

(a) a lower end;

(b) an inner wall defining the outer boundary of the die gap, said wall having:

(1) a first step adjacent to the lower end of the die casing ring and having an inner radially undulating circumferential profile and a radially undulating first step edge defining the boundary between the first step and the lower end of the casing ring, and

(2) a second radially inwardly disposed step adjacent to the first step and having an inner radially symmetrical profile and a radially symmetrical second step edge defining the boundary between the first step and the second step;



(c) the ring steps independently defining the outer boundary of the die gap as a function of relative axial positions of the casing ring and die core;

(d) said die core and the casing ring, with the first and second steps thereof, being axially movable with respect to each other to selectively position the die core in cooperating lateral alignment with the first and second steps; and

(e) means for axially moving the die core and casing ring, with the first step and second step thereof, with respect to each other to selectively position the die core in cooperating lateral alignment with the first and second steps.

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**4,422,840**

**VENTING DEVICE FOR A CLOSED MOLD**

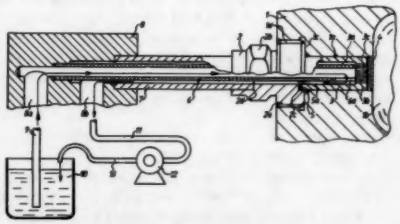
**Gerhard Posch, Unterhaching, and Rolf Nefzger, Munich, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany**

**Filed Oct. 30, 1980, Ser. No. 202,060**

**Claims priority, application Fed. Rep. of Germany, Nov. 30, 1979, 2948318**

**Int. Cl.³ B29C *1/00*; B29F *1/00***

**U.S. Cl. 425—472** **21 Claims**



1. A ventilating device for a shaping tool having a wall and a mold cavity the device comprising a gas-permeable member communicating with the cavity of the shaping tool; a supporting member connected with and arranged to support said gas-permeable member and having a plurality of ventilating openings communicating with the cavity of the shaping tool through said gas-permeable member; means for holding and fixing said supporting member within the wall of the shaping tool, said holding and fixing means being connected and easily

withdrawable together with said supporting member so as to remove said supporting member together with said gas-permeable from the wall of the shaping tool, thereby providing easy access to the gas-permeable member so that the latter is replaceable without removing the shaping tool; and means forming a suction chamber which communicates with said ventilating openings of said supporting member 13 suitable for passing flushing liquid to said gas-permeable member.

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**4,422,841**

## HOT RUNNER SYSTEM IN PLASTICS MOLDING TOOLS

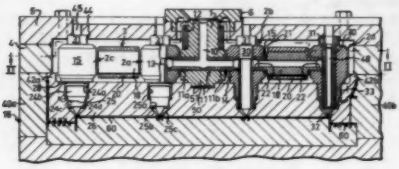
**Dante Alfonsi, Hedegatan 16, 252 51 Helsingborg, and Stefan Alfonsi, Stationsgatan 10, 253 73 Helsingborg, both of Sweden**

**Filed May 4, 1982, Ser. No. 374,774**

**Claims priority, application Sweden, May 7, 1981, 8102863**

**Int. Cl.³ B29F 1/08**

**U.S. Cl. 425—548** **3 Claims**



1. A hot runner system for use in combination with a plastics molding tool having at least one mold cavity, said hot runner system being employed for injection molding of plastics material into said at least one cavity and comprising a heated central inlet means having an inlet channel means, a plurality of heated sprue bushes each having an outlet end portion and an opposite end portion, and a plurality of heated runner pipes connecting said inlet channel means with said sprue bushes, said molding tool comprising a mold platen having bores forming sockets for receiving the outlet end portions of said sprue bushes in positions for injecting plastics material into said at least one molding cavity, each of said sprue bushes and each of said sockets comprising cooperating annular contact surfaces for radially and axially locating said sprue bushes in said sockets, each of said sprue bushes forming a housing for a probe removably inserted therein, each probe having an inner tip end portion at the outlet end of the respective sprue bush and having an opposite outer end, said opposite end portion of each of the sprue bushes comprising a connecting head having at least one transverse channel for connecting the respective sprue bush with at least one of said runner pipes, each of said probes defining with its housing an annular space extending axially from the outlet end of the respective sprue bush, in communication with said at least one mold cavity, to the transverse channel of the respective sprue bush, each probe having an axial bore coaxial with said annular space and extending from the outer end of the respective probe to the tip end portion, and a heating element removably inserted into said axial bore from the outer end of the probe and removably fixed therein, said heating element being coaxial with said annular space and extending substantially along the whole length of the respective annular space for heating plastics material injected through said annular space and for heating the respective sprue bush substantially along the whole length of the annular space, each of said probes having a head at its outer end protruding from the respective sprue bush, and further comprising a clamping plate and means for securing said clamping plate to said mold platen and forcing said clamping plate to exert pressure on said heads of said probes for holding the heads of the probes clamped onto said opposite end portions of said sprue bushes and thereby holding the sprue bushes clamped and fixed in relation to said sockets.

2. A hot runner system for use in combination with a plastics molding tool having at least one mold cavity, said hot runner system being employed for injection molding of plastics material into said at least one cavity and comprising a heated central inlet means having an inlet channel means, a plurality of heated sprue bushes each having an outlet end portion and an opposite end portion, and a plurality of heated runner pipes connecting said inlet channel means with said sprue bushes, said molding tool comprising a mold platen having bores forming sockets for receiving the outlet end portions of said sprue bushes in positions for injecting plastics material into said at least one molding cavity, each of said sprue bushes and each of said sockets comprising cooperating annular contact surfaces for radially and axially locating said sprue bushes in said sockets, each of said sprue bushes forming a housing for a probe removably inserted therein, each probe having an inner tip end portion at the outlet end of the respective sprue push and having an opposite outer end, said opposite end portion of each of the sprue bushes comprising a connecting head having at least one transverse channel for connecting the respective sprue bush with at least one of said runner pipes, each of said probes defining with its housing an annular space extending axially from the outlet end of the respective sprue bush, in communication with said at least one mold cavity, to the transverse channel of the respective sprue bush, each probe having an axial bore coaxial with said annular space and extending from the outer end of the respective probe to the tip end portion, and a heating element removably inserted into said axial bore from the outer end of the probe and removably fixed therein, said heating element being coaxial with said annular space and extending substantially along the whole length of the respective annular space for heating plastics material injected through said annular space and for heating the respective sprue bush substantially along the whole length of the annular space, and comprising means for securing said probes in said sprue bushes and securing the latter in said sockets, said securing means including cooperating annular supporting surfaces of each probe and each sprue bush, cooperating supporting surfaces of said mold platen and each sprue bush and a clamping plate which is adapted to be removably fixed to said mold platen and to clamp said sprue bushes in operating positions in said sockets by clamping said probes in operating positions in said sprue bushes.

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**4,422,842**

## APPARATUS FOR INJECTING PLASTICS AND ELASTOMERS

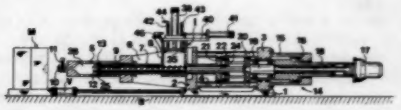
**Bernard Monnet, Bellignat, France, assignor to Pont-A-Mousson S.A., Nancy, France**

**Filed May 28, 1981, Ser. No. 267,979**

**Claims priority, application France, Jun. 2, 1980, 80 12251; Nov. 28, 1980, 80 25408**

**Int. Cl.³ B29F 1/00**

**U.S. Cl. 425—561** **18 Claims**



1. An injection apparatus for plastics, elastomers or like materials, comprising: an elongate, hollow fixed sheath (5) having an injection orifice (10) at an exit end thereof, an elongate, smooth walled, hollow movable sheath (7) slidably disposed within the fixed sheath and defining therewith proximate said exit end a variable volume injection material chamber (26), an injection material supply device (8) mounted to and movable with the movable sheath and exiting into the hollow interior thereof, an orifice defined in an exit end of said movable sheath communicating between the hollow interior thereof and the variable volume chamber, valve means (12, 13) for opening and closing said movable sheath orifice, means (22)

for selectively actuating said valve means, said actuating means comprising separation jacks (22), said separation jacks maintaining said valve means in an open state as said injection material supply device supplies said injection material into said variable volume injection material chamber, means (14) for advancing the movable sheath with the fixed sheath to reduce the volume of said chamber and force injection material through said fixed sheath orifice and into a mold (M), means (6) rigidly connecting the fixed sheath to the advancing means, and means (V) for moving the injection apparatus in relation to the mold to minimize thermal heat exchange therebetween.

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**4,422,843**

**INJECTION STRETCHING BLOW MOLDING MACHINE**

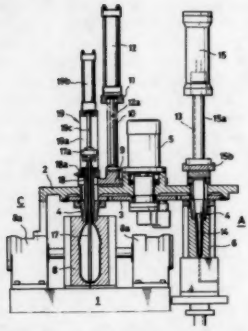
**Katashi Aoki, 6037 Ohazaminamijo, Sakakimachi, Hanishina-gun, Nagano-ken, Japan**

**Filed Mar. 10, 1982, Ser. No. 356,919**

**Claims priority, application Japan, Mar. 13, 1981, 56-36912**

**Int. Cl.³ B29C 17/07**

**U.S. Cl. 425—525** **6 Claims**



1. An injection, stretching and blow molding machine for parisons, comprising:

a machine bed; a base plate supported spaced above and parallel to the machine bed; a rotary disk supported to the base plate; a plurality of spaced apart neck molds, each for the neck of a respective parison, being supported at the disk, for the parison to be supported at the neck mold and beneath the disk; drive means connected with the disk for rotating the disk, at spaced time intervals, with respect to the base plate;

at spaced locations on the machine bed, there are defined, in the following sequence, around the disk, and located stationary with respect to the rotating disk, the following stages:

(a) an injection molding stage comprising: an injection mold for injection molding each parison in turn;

(b) a temperature control stage, comprising: a temperature control core for movement down into and up out of a parison which has been formed in the injection mold and which is supported at this stage by the neck mold; the temperature control core being heatable;

(c) a stretching and blow molding stage, comprising: a blow mold device, including a blow mold for the parison then at the stretching and blow molding stage and which is supported at this stage by the neck mold; a blow core and a stretching and blowing mechanism for the parison and both being movable up and down, with the blow core having movement down into and up out of the parison supported at that stage;

(d) a molded product release stage, including a releasing core for opening the neck mold for releasing a molded parison held by the neck mold; the releasing core being movable up and movable down, with the downward movement operating the neck mold to release the parison at that stage;

an actuating plate on the base plate and extending around the disk to the temperature control stage, the stretching blow molding stage and the releasing stage without extending to the injection molding stage; a lifting device for moving the actuating plate up and down and with respect to the base plate, and guide means for guiding the actuating plate up and down movement;

the temperature control core, the blow core and the stretching and blowing mechanism, and the releasing core being mounted on the actuating plate to all move up and down together.

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**4,422,844**

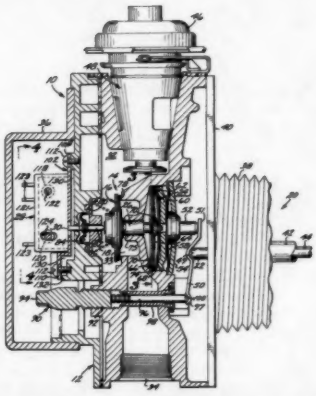
**SNAP ACTING THERMOSTATIC FLUID VALVE AND ELECTRICAL SWITCH COUPLED THERETO**

**Marvin M. Graham, Westminster, and Jay R. Katchka, Cypress, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.**

**Continuation of Ser. No. 935,165, Aug. 21, 1978, abandoned. This application Jan. 29, 1981, Ser. No. 229,517**

**Int. Cl.³ F23N 5/00; H01H 9/06**

**U.S. Cl. 431—72** **10 Claims**



1. A thermostatic gas control valve mechanism comprising a valve housing having an internal valve port, a valve closure member, biasing means interposed between said closure member and said housing urging said closure member to seal said internal valve port, a thermostatic actuator secured to said housing with a force transmitting end received within said housing and coupled to act in opposition to said biasing means, a snap acting member interposed between said thermostatic actuator and said closure member and operable by said thermostatic actuator and said biasing means to move between alternate stable positions, a reciprocal rod interposed between said snap acting member and said closure member to drive said closure member against the bias of said biasing means to unseal said valve port when said snap acting member is in one of its stable positions and to allow said closure member to close said internal valve port when said snap acting member is in an alternative stable position, and electric switch having a push-button actuating means coupled to move with said valve closure member, adjustable securing means for securing said electric switch to said housing, and said securing means for releasably securing said electric switch in a selected position and orientation relative to said housing, whereby the distance between said valve port and said electric switch is adjustably variable, a saddle shaped electric switch mounting bracket defining a channel with opposing walls between which said electric switch is positioned, wherein end flanges extend from

said channel and are secured to said housing, and said channel walls have aligned pairs of apertures therethrough separated in a direction transverse to the direction of movement of said reciprocal rod, and one of said pairs of apertures is remote from axial alignment with said reciprocal rod and the other pair of apertures is proximate to axial alignment with said reciprocal rod, and said electric switch includes an encompassing body which has a circular aperture therethrough aligned with said apertures in said channel walls remote from axial alignment with said reciprocal rod and an arcuate aperture therethrough aligned with said reciprocal rod and an arcuate aperture therethrough aligned with said apertures in said channel walls proximate to axial alignment with said reciprocal rod, and wherein said adjustable securing means are releasable fasteners which extend through said apertures in said channel walls and through said body of said electric switch, whereby the rotational orientation of said electric switch in said switch mounting bracket is adjustable within limits defined by said arcuate aperature.

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**4,422,845**

## LIQUID HYDROCARBON BURNER WITH VERTICALLY ADJUSTABLE WICK

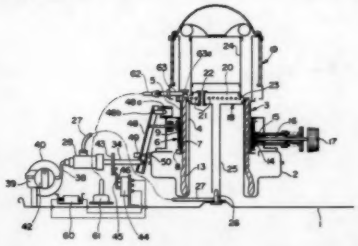
**Yozo Yamaguchi, Joetsu, Japan, assignor to Isaburo Yamaguchi, Nigata, Japan**

**Filed Aug. 12, 1981, Ser. No. 292,153**

**Claims priority, application Japan, Sep. 8, 1980, 55-123541; Apr. 15, 1981, 56-53242[U]**

**Int. Cl.³ F23D *11/36, 3/32***

**U.S. Cl. 431—153** **7 Claims**



1. A liquid hydrocarbon burner having a wick adapted to be partially immersed in liquid hydrocarbon, means to raise and lower the wick, means to supply a combustible gas to the region of an exposed portion of the wick, electric means to ignite the gas thereby to ignite liquid hydrocarbon in the wick, means responsive to raising of the wick to supply said gas and to actuate said electric means to ignite said gas, means responsive to the attainment of a raised position by said wick, to discontinue said gas supply and said ignition of said gas, and means responsive to lowering of the wick to actuate once more said gas supply and ignition, thereby to ignite fumes from the wick after extinction of the wick.

**4,422,846**

## METHOD AND APPARATUS FOR INDIRECTLY DRYING AND PREHEATING FINE MATERIAL

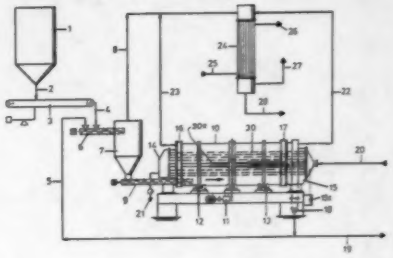
**Heinrich Weber, Recklinghausen; Kurt Lorenz, Hattingen, and Horst Dungs, Herne, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Japan**

**Division of Ser. No. 295,496, Aug. 24, 1981, Pat. No. 4,392,823. This application Jul. 2, 1982, Ser. No. 394,838**

**Claims priority, application Fed. Rep. of Germany, Sep. 17, 1980, 3034952**

**Int. Cl.³ F26B *9/12*; F27B *7/10***

**U.S. Cl. 432—18** **6 Claims**



1. A method of indirectly drying and preheating fine material, comprising:

providing a rotary drum having a plurality of heating tubes extending therethrough;

supplying heated cooling gases from a dry coke cooling system, from which dust has been separated, to the heating tubes;

feeding the fine material to be dried and preheated to the rotary drum for preheating and drying the fine material;

removing the dried and preheated fine material from the rotary drum; and

recycling a portion of the dried and preheated material to the rotary drum.

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**4,422,847**

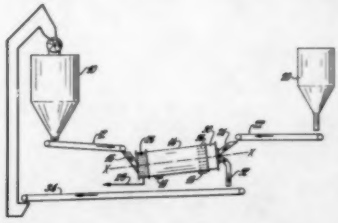
## PREHEATING GLASS BATCH

**Mark A. Propster, Gahanna; Charles M. Hobman, Granville, and Stephen Seng, Frazeysburg, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Filed Dec. 28, 1981, Ser. No. 335,006**

**Int. Cl.³ F27D *17/00*; F27B *15/00*; F28B *3/00***

**U.S. Cl. 432—28** **9 Claims**



1. Apparatus for preheating particulate glass batch comprising a rotatable container for mixing said batch with particulate heat transfer media in a heat transfer relationship, said heat transfer media being larger in particle size than said batch, and a media exit vestibule for separating said media from said batch comprising a generally cylindrical screen mounted for rotation about its symmetrical axis, said screen having openings suffi-

ciently small to prevent the passage of said media therethrough and sufficiently large to enable the passage of said batch therethrough, carrier means mounted for coaxial rotation with said screen for lifting the separated batch, and means for directing the separated batch from said exit vestibule into said container.

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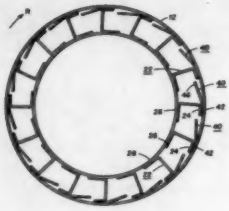
4,422,848

## HEAT SHIELDS FOR DRUM AGGREGATE DRIERS AND ASPHALTIC DRUM MIXERS

Joseph E. Musil, Ely, Iowa, assignor to Iowa Manufacturing Company of Cedar Rapids, Iowa, Cedar Rapids, Iowa

Filed Jan. 29, 1982, Ser. No. 344,208
Int. Cl.³ F27B 7/14; F27D 3/00
U.S. Cl. 432—118 1 Claim



1. In apparatus of the kind described including a cylindrical shell and burner means disposed adjacent one end of the shell, the burner means discharging a flame of hot gases axially into the shell from said end, and a set of flights extending axially of the shell and spaced circumferentially about the inner wall of the shell, the improvement comprising: a set of heat shields extending axially of the shell and disposed between respective ones of the flights in spaced relation to the inner wall of the shell effective to shield the wall of the shell between the flights from the radiant zone of the flame, each heat shield comprising an essentially rectangular plate having opposite edge portions extending axially of the shell, one of the edge portions being planar and sandwiched between one flight and the inner wall of the shell, the remainder of the heat shield being also planar and bent at an obtuse included angle relative to said one portion effective so that the spacing between the inner wall of the shell and said remainder of the heat shield progressively increases toward and is a maximum at the other edge portion, said other edge portion lying close to an adjacent flight but unsecured thereto.

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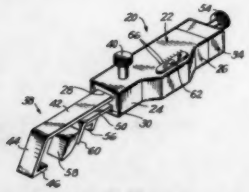
4,422,849

## DENTAL INSTRUMENT AND METHOD FOR POSITIONING A LINGUAL ORTHODONTIC BRACKET

Michael K. Diamond, 86 Millburn La., Roslyn, N.Y. 11577

Filed Nov. 17, 1981, Ser. No. 322,193
Int. Cl.³ A61C 7/00
U.S. Cl. 433—3 30 Claims



1. An instrument for positioning a lingual orthodontic bracket, said instrument comprising:
(a) a housing;
(b) an arm extending from said housing and including means for releasably holding the orthodontic bracket at a position that is in opposition to the lingual surface of the tooth being treated; and
(c) level indicating means for displaying the extent of inclination of said arm with respect to a predetermined plane.

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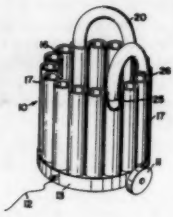
4,422,850

## EDUCATIONAL TOY AND CONTAINER

Bonnie J. Groebner, 18660 Yakmia St., Anoka, Minn. 55303

Filed Jun. 1, 1981, Ser. No. 268,860
Int. Cl.³ G09B 19/00
U.S. Cl. 434—98 23 Claims



1. A combination educational toy and container comprising:
(a) a base;
(b) a plurality of cylindrical tubes defining a closed surface and cooperatively connected with said base for defining therewith an internal cavity of generally circular cross-section;
(c) said plurality of cylindrical tubes having a top surface having at least one hole formed therein;
(d) an insertable member having first and second ends; and
(e) said hole being adapted to hold said first end of said insertable member, whereby said first end of said insertable member may be inserted and removed from said hole.

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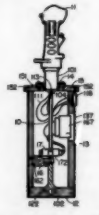
4,422,851

## ISOMETRIC GRIP BENDING BEAM CONTROL

Lawrence Hayashigawa, Tustin, and Bertram W. McFadden, Downey, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 12, 1982, Ser. No. 377,240
Int. Cl.³ G09B 9/08
U.S. Cl. 434—45 9 Claims



1. An apparatus for simulating a control stick in an aviation trainer comprising:
a hand grip:
a cantilevered bending beam attached to said hand grip, said beam being a circular cross-section steel rod having an endurance limit in excess of the maximum stress exerted on said grip;
means for restricting the displacement of said bending beam operably positioned therefor;
means for measuring beam bending stress exerted on said

hand grip operably attached to said bending beam, outputting signals proportional to pitch and roll positions.

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**4,422,852**

## TEACHING AID AND PROCESS FOR TEACHING

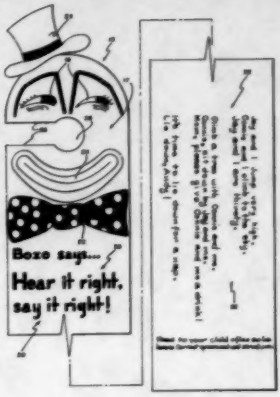
**Emily A. Mathias, 205 S. Star, El Dorado, Kans. 67042**

**Filed Mar. 1, 1982, Ser. No. 353,572**

**Int. Cl.³ G09B *19/00***

**U.S. Cl. 434—178** **2 Claims**

1. A teaching aid for hanging on the shaft of a doorknob comprising a generally elongated structural backing having an end representing pictorially a face; said structural backing defining an open rectangular slot having a width approximately equivalent to the outside diameter of the doorknob shaft and terminating into a generally central opening having a diameter larger than the width of the rectangular slot and larger than the outside diameter of the doorknob shaft to facilitate pivotation of the structural backing around the knob shaft; arranged erudite indicia printed on the backing in a visual presentation form for rapid and comprehensive understanding; said doorknob shaft sliding through open slot into said central opening such that said doorknob defines a nose for said face, said indicia is printed such that a part of the indicia can be read readily when the teaching aid is hung on the shaft in a generally vertical upright position and the remaining indicia can be read readily if the teaching aid is pivoted around the knob shaft into a generally parallel posture with respect to the horizontal, the end representing pictorially the face is structurally shaped to define a hat for the head of said face, said open slot swaths part of the face which pictorially defines an end of the structural backing, and said pictorally represented face additionally comprises a pair of eyes, and a bow tie.



## 4,422,853
## HAIR DYEING COMPOSITIONS CONTAINING QUATERNIZED POLYMER

**Bernard Jacquet, Antony, and Gerard Lang, Denil-la-Barre, both of France, assignors to L'Oreal, Paris, France**

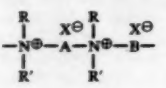
**Continuation-in-part of Ser. No. 849,657, Nov. 8, 1977, Pat. No. 4,217,914, which is a continuation-in-part of Ser. No. 577,836, May 15, 1975, abandoned. This application Jun. 26, 1980, Ser. No. 163,411**

**Claims priority, application Luxembourg, May 16, 1974, 70096; Feb. 14, 1975, 71849**

**Int. Cl.³ A61K** *7/09, 7/11;* **D06P** *3/14*

**U.S. Cl. 8—406** **6 Claims**

1. A composition suitable for dyeing hair in the presence of an oxidizing agent comprising an oxidation hair dye in an amount effective to dye said hair and a quaternized polymer having recurring units of the formula



wherein

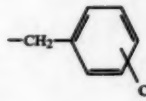
R is lower alkyl or —$CH_2$—$CH_2OH$;

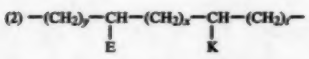
R′ is alkyl or cycloalkyl, containing a maximum of 20 carbon atoms or benzyl,

or R and R′ together represent —$(CH_2)_2$—O—$(CH_2)_2$—;

A is divalent group selected from

(1) o-, m- or p-xylylidene of the formula



(2) 

wherein x, y and t are whole numbers ranging from 0 to 11 such that the sum (x+y+t) is greater than or equal to 0 and lower than 18, and E and K represent hydrogen or alkyl having less than 18 carbon atoms,

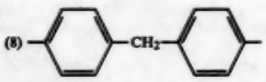
(3) —$(CH_2)_n$—S—$(CH_2)_n$—,

(4) —$(CH_2)_n$—O—$(CH_2)_n$—,

(5) —$(CH_2)_n$—S—S—$(CH_2)_n$—,

(6) —$(CH_2)_n$—SO—$(CH_2)_n$—,

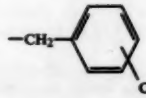
(7) —$(CH_2)_n$—$SO_2$—$(CH_2)_n$— and

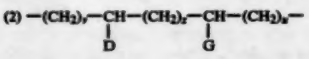
(8) 

wherein n is equal to 2 or 3;

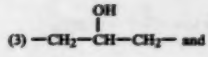
B represents a divalent group selected from

(1) o-, m- or p-xylylidene of the formula



(2) 

wherein D and G represent hydrogen or alkyl having less than 18 carbon atoms and v, z and u are whole numbers ranging from 0 to 11, with two of v, z and u simultaneously being capable of being 0, such that the sum (v+z+u) is greater than or equal to 1 and lower than 18 and such that the sum (v+z+u) is greater than 1 when the sum (x+y+t) is equal to 0,

(3) 

(4) —$(CH_2)_n$—O—$(CH_2)_n$— wherein n is 2 or 3; and

$X^-$ is an anion derived from an organic or mineral acid, said polymer being present in an amount between 0.5 and 10 percent by weight of said composition and a carrier.

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## 4,422,854
## TRANSFER PRINTING SUPPORT, PROCESS FOR THE MANUFACTURE THEREOF, WITH BLUE AZO DYE:DI-CYANO-NITRO-PHENYL-AZO ANILINE

**Reinhard Hähnle, Königstein; Manfred Schneider, Eppstein; Claus Schuster, Hofheim am Taunus, and Rudolf Schickfluss, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

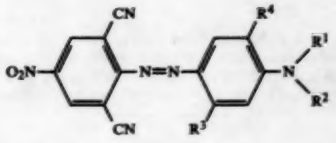
**Filed Jun. 1, 1982, Ser. No. 383,732**

**Claims priority, application Fed. Rep. of Germany, Jun. 3, 1981, 3121981**

**Int. Cl.³ B41M** *5/02;* **D06P** *5/00*

**U.S. Cl. 8—471** **9 Claims**

1. A transfer printing support, impregnated or printed with a formulation containing the dyestuff of the formula



in which

$R^1$ is alkyl of from 1 to 4 carbon atoms,

$R^2$ is hydrogen or alkyl of from 1 to 4 carbon atoms,

$R^3$ is methyl, methoxy or ethoxy, and

$R^4$ is hydrogen, methyl, methoxy or ethyoxy, or containing a mixture of dyestuffs of said formula.

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## 4,422,855
## METHOD OF THICKENING SOLUTIONS USING NORMALLY NONGELLING CLAYS

**Edgar W. Sawyer, Jr., Hagerstown, Md., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed May 15, 1981, Ser. No. 263,808**

**Int. Cl.³ C10L** *1/32;* **B01J** *13/00*

**U.S. Cl. 44—51** **14 Claims**

1. A method of thickening an aqueous solution using a normally nongelling clay comprising the steps of:

providing a nongelling clay selected from the group consisting of aluminum montmorillonite and calcium montmorillonite;

drying the clay to 10 to 15 percent free moisture;

grinding the clay to at least 100 percent finer than about 45 microns;

adding a condensed phosphate dispersant to the clay and forming a predispersion;

providing a flocculent capable of neutralizing the dispersant;

adding the predispersion and flocculent to an aqueous solution; and

stirring the solution until said solution thickens.

11. A method of thickening an organic liquid using a normally nongelling clay comprising the steps of:

drying nongelling aluminum or calcium montmorillonite clay to 10 to 15 percent free moisture;
grinding the clay to at least 100 percent finer than about 45 microns;
adding the clay with a surfactant selected from the group consisting of a quaternary ammonium compound, an amine salt, an imidazoline and an alkanolamide to an organic liquid; and
agitating the resulting product until the clay gels.

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**4,422,856**

## N-SUBSTITUTED SUCCINIMIDES, THEIR PREPARATION AND USE AS MOTOR FUEL ADDITIVES

**Paul Maldonado, Saint Symphorien d'Ozon; Choua Cohen, and Bernard Sillion, both of Lyons, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison and Elf-France, Paris, both of, France**

**Filed Feb. 13, 1981, Ser. No. 234,134**
**Claims priority, application France, Feb. 15, 1980, 80 03459**
**Int. Cl.³ C10L 1/22**
**U.S. Cl. 44—63** **13 Claims**

1. The N-substituted succinimide obtained by reacting maleic anhydride with at least one oxyalkylated or polyoxyalkylated monoalcohol of the general formula

$$R^1\text{-}(\text{-O-A-})_n\text{OH}$$

wherein $R^1$ is a linear or branched, saturated or unsaturated $C_{12-25}$ aliphatic radical; A is a linear or branched $C_{2-4}$ alkylene radical, at least two carbon atoms of which are in a straight chain; and n is an integer from 1 to 50; and reacting the resulting succinic anhydride oxyether with a monoprimary amine of the general formula

$$R^2\text{-}(\text{-X-Z-})_m\text{NH}_2$$

wherein $R^2$ is a linear or branched, saturated or unsaturated, $C_{8-25}$ aliphatic radical; Z is a linear or branched $C_{2-4}$ alkylene radical at least two carbon atoms of which are in a straight chain; X is —NH— or —O—; and m is an integer from 0 to 4.

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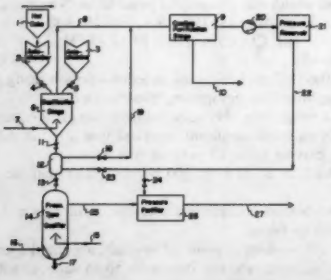
**4,422,857**

## COKE GASIFICATION METHOD

**Heinrich Weber, Recklinghausen; Horst Dungs, Herne, and Kurt Tippmer, Recklinghausen, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & KG, Fed. Rep. of Germany**

**Division of Ser. No. 289,158, Aug. 3, 1981. This application Jul. 15, 1982, Ser. No. 398,593**
**Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032212**
**Int. Cl.³ C10J 3/06, 3/16**
**U.S. Cl. 48—197 R** **5 Claims**



1. A method of uniformly charging a pressure-type gasifier with hot coke, comprising the steps of charging over a pressure-dosing system with at least four parallel-connected lock chambers, in which the following steps in the four lock chambers take place simultaneously:
filling a first lock with hot coke;
comprising a second lock, which has already been filled with hot coke, with a compression gas up to the gasifier pressure;
transfering hot coke from a third lock to the pressure-type gasifier; and
expanding a fourth lock, wherein the hot coke is formed in a coking chamber with a temperature of 900° C. to 1,100° C., the hot coke is fed by means of a hot coke conveyor without substantial temperature changes with the coke at a temperature of 900° C. to 1,100° C. to a first gasification chamber, the coke is partially gasified and cooled to 500° C. to 800° C. in the first gasification chamber by the addition of steam, then the partially gasified coke is fed to the pressure-type gasifier via said parallel-connected lock chambers, and wherein the coke is gasified in the pressure-type gasifier in a second gasification chamber thereon with the addition of at least one of oxygen and air, and at least one of steam and carbon dioxide.

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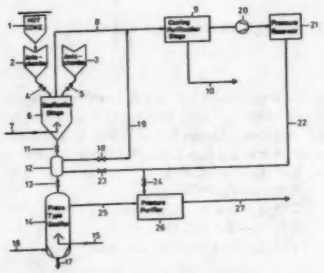
**4,422,858**

## COKE GASIFICATION METHOD

**Heinrich Weber, Recklinghausen; Horst Dungs, Herne, and Kurt Tippmer, Recklinghausen, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany**

**Filed Aug. 3, 1981, Ser. No. 289,158**
**Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032212**
**Int. Cl.³ C10J 3/06, 3/16**
**U.S. Cl. 48—197 R** **6 Claims**



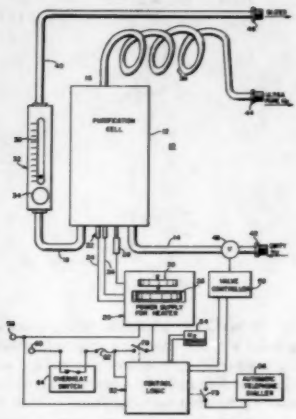
1. A method for the gasification of coke having a temperature of 900° C. to 1,100° C. after coking in a coking chamber, comprising:
forcing the coke at a temperature of 900° C. to 1,100° C. into a coke bucket, after coking the coke in the coking chamber;
feeding the coke by means of a hot coke conveyor without substantial temperature changes and with the coke at a temperature of 900° C. to 1,100° C., to a first coking and gasification stage of a gasifier;
adding steam to the first coking and gasification stage to cool the coke to 500° C. to 800° C. for partially gasifying the coke;
subsequently feeding the partially gasified and cooled coke over a pressure-dosing system to a second coking and gasifying stage of the gasifier which comprises a pressure-type gasifier stage; and
gasifying the partially gasified and cooled coke in the second coking and gasification stage by solid bed gasification with the addition of at least one of oxygen and air, and at least one of steam and carbon dioxide.

4,422,859

## APPARATUS AND METHOD FOR SAFELY PURIFYING HYDROGEN GAS

William R. McGee, Newtown Square, Pa., assignor to Consolidated Technology Corporation, West Chester, Pa.

Filed May 24, 1982, Ser. No. 381,723
Int. Cl.³ B01D 53/22
U.S. Cl. 55—16 12 Claims



1. A method for preventing explosions in hydrogen gas diffusion purification units, each of the units having a hydrogen gas diffusion cell with an input for hydrogen gas to be purified, an electrical power supply for heating the diffusion cell to an operating temperature, a temperature sensor disposed within the diffusion cell and connected to the electrical power supply, an output for ultra-purified hydrogen and an output for waste gas the method comprising the steps of:

continuously sensing for the presence of hydrogen gas, at a predetermined level of concentration, outside and adjacent the diffusion cell, the gas input and the gas outputs;

electronically monitoring the continuous sensing for the presence of hydrogen gas;

continuously, and independently of the hydrogen gas presence monitoring, sensing the temperature outside and adjacent the diffusion cell and the continuous monitoring;

disabling only the electrical power supply for the diffusion cell and interrupting the input of hydrogen gas to be purified whenever hydrogen gas is detected at the predetermined level; and,

disabling the electrical power supply to the entire unit whenever a predetermined temperature level is detected, the hydrogen gas flow through the diffusion units being interrupted.

6. An apparatus for safely purifying hydrogen gas, comprising:

a hydrogen gas diffusion cell for filtering hydrogen gas, the cell having an input for hydrogen to be purified, electrical heating means, an output for ultra-purified hydrogen and an output for waste gas, including hydrogen gas mixed with concentrated corrosive agents;

an electrical power supply for heating the diffusion cell to an operating temperature;

a temperature sensor disposed within the diffusion cell for detecting the temperature therein;

means for detecting hydrogen gas, disposed outside of the diffusion cell but adjacent the input and outputs thereof;

a control circuit, connected to the means for detecting the hydrogen gas, for generating a command signal when hydrogen is detected at a level of concentration exceeding a predetermined amount;

means for disabling the electrical power supply and for interrupting the hydrogen gas input in response to the command signal, whereby explosive concentrations of hydrogen gas are avoided; and,

an independently operable ambient temperature overheat sensing switch disposed adjacent the diffusion cell and the control circuit for interrupting electrical power thereto when ambient temperatures exceed a predetermined level, whereby explosive temperatures due to overheating of either one of the diffusion cell and the control circuit are avoided and the hydrogen gas flow through the diffusion cell in interrupted.

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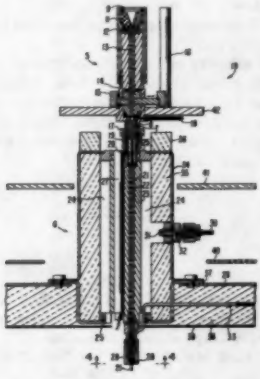
4,422,860

## ON-COLUMN CAPILLARY GAS CHROMATOGRAPHIC INJECTOR

Paul L. Feinstein, Berkeley, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jan. 26, 1982, Ser. No. 342,958
Int. Cl.³ B01D 15/08
U.S. Cl. 55—67 25 Claims



1. An injector for introduction of a liquid sample directly into a capillary gas chromatographic column, the point of injection within said column being enclosed within a temperature controlled zone, comprising:

means for heating said column within said temperature controlled zone to at least the vaporization temperature of said sample during a portion of the injection cycle, said temperature controlled zone being located outside the oven of said gas chromatograph;

means for maintaining said column within said temperature controlled zone at a temperature below the vaporization temperature of said liquid sample while said liquid sample is introduced through the end of said column directly to said point of injection;

duct means for holding said end of said gas capillary column, said duct means serving to fix and stabilize said column to thereby permit liquid samples to be introduced directly into said column at said point of injection; and

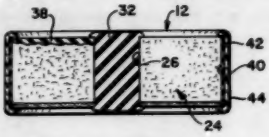
sealing means within said duct means for enabling introduction of said liquid sample without fluctuation in the carrier gas flow.

4,422,861

## AEROSOL FILTER CARTRIDGE

Robert J. Dusza, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 5, 1982, Ser. No. 345,955
Int. Cl.³ B01D 46/52
U.S. Cl. 55—498 10 Claims




1. A filter for a respirator cartridge, said filter comprising:
an encirclement of an accordian pleated filter medium with opposite ends joined and providing an open core area so as to define open internal and external edges of pleating of said encirclement;
first adhesive means sealing together said joined opposite ends of said encirclement of filter medium;
second adhesive means filling said core area as a seal for said internal open edges of said pleating;
third adhesive means extending about said external open edges of pleating for covering and sealing said external open edges of said pleating, said third adhesive means comprising a hot melt adhesive strip;
a layer of heat shrinkable material overlying said third adhesive means; and
said third adhesive means and said layer of heat shrinkable material being respectively heat softened and heat shrunken tightly against said encirclement of pleated filter medium so as to effect positive sealing of said external open edges of said pleated medium and rigidifying of said encirclement of filter medium.

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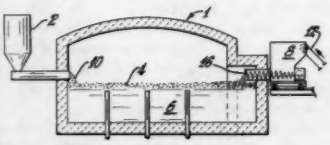
4,422,862

## PROCESS FOR REUSING SCRAP GLASS

William G. Wardlaw, Anderson, S.C., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 12, 1982, Ser. No. 357,496
Int. Cl.³ C03B 3/00
U.S. Cl. 65—28 4 Claims



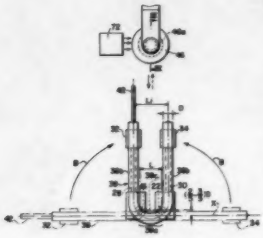

1. A process for using scrap glass with organic material thereon including:
feeding unmelted glass batch to a glass melting furnace to form a blanket of the batch on the surface of molten glass in the furnace; and
feeding unmelted scrap glass with organic material thereon on top of the blanket in the furnace independently of the batch, the scrap glass being fed so that the organic material is burned off before the scrap glass begins to melt.

4,422,863

## APPARATUS AND METHOD FOR BENDING A GLASS TUBE TO A U SHAPE

Hisao Hosoya, Yokohama, and Yukio Sato, Yokosuka, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 12, 1982, Ser. No. 339,050
Claims priority, application Japan, Jan. 23, 1981, 56-8764
Int. Cl.³ C03B 23/06
U.S. Cl. 65—110 12 Claims



1. An apparatus for bending a glass tube to a U shape having two generally parallel legs each having a longitudinal axis, said glass tube having a centrally disposed predetermined zone for bending, a diameter, and an axis, the apparatus comprising:
a pair of chucks for holding said glass tube at both sides of the centrally disposed predetermined zone for bending;
a heating device, said heating device cooperating with said chucks so as to heat and soften said glass tube in the predetermined zone for bending;
a turning mechanism on which said chucks are mounted, said turning mechanism being operable to rotate each of said chucks about a respective turning center, said turning centers being disposed along a line generally parallel to said axis and spaced from said axis by a first predetermined distance, said turning centers being spaced from each other along said line by a second predetermined distance which is less than a third predetermined distance defined by the separation of the longitudinal axes of said generally parallel legs;
a bending drum to guide bending at said predetermined zone;
a moving device for said bending drum, said bending drum being mounted on said moving device, said moving device being movable so that said bending drum comes into contact with said glass tube in said predetermined zone thereof immediately before the glass tube is bent by said turning mechanism and so that said bending drum is removed from said predetermined zone of said glass tube before bending is complete.

12. A method for bending a glass tube into a U shape, the glass tube having a longitudinal axis and a predetermined zone for bending, the method comprising the steps of:
(a) positioning a glass tube in a pair of spaced chucks, such that the tube extends between the chucks, each of the chucks being disposed on an arm which turns about a separate turning point, said turning points being spaced from each other along a line parallel to and spaced from said longitudinal axis;
(b) moving a heater into a position adjacent to the predetermined bending zone of the glass tube;
(c) heating the predetermined zone of the glass tube to a temperature ready for bending;
(d) removing the heater from its position adjacent the predetermined zone;
(e) advancing a bending drum into contact with the predetermined bending zone of the glass tube;
(f) turning the arms about their respective turning points to move the chucks toward one another, thereby winding

the predetermined bending zone about the bending drum; and

(g) retracting the bending drum from the predetermined bending zone before said turning step is complete.

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**4,422,864**

## CYCLOHEXANEDIONE DERIVATIVES, THEIR PREPARATION AND HERBICIDES CONTAINING THEM

**Rainer Becker, Bad Durkheim; Dieter Jahn, Neckarhausen; Wolfgang Rohr, Wachenheim; Walter Himmele, Walldorf; Hardo Siegel, Speyer, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

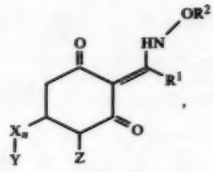
**Filed May 20, 1982, Ser. No. 380,469**

**Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121355**

**Int. Cl.³ A01N** *9/12, 9/20;* **C07D** *309/04, 333/22*

**U.S. Cl. 71—88** **6 Claims**

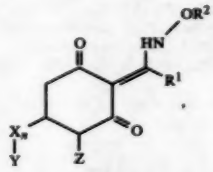
1. A cyclohexadione derivative of the formula



I

where $R^1$ is alkyl of 1 to 4 carbon atoms, $R^2$ is alkyl of 1 to 4 carbon atoms, alkenyl of 3 or 4 carbon atoms, alkynyl of 3 or 4 carbon atoms or haloalkenyl of 3 to 4 carbon atoms and 1 to 3 halogen atoms, X is straightchain or branched alkylene of 1 to 5 carbon atoms, which is unsubstituted or substituted by phenyl, n is 0 or 1, Y is, selected from the group consisting of tetrahydropyranyl, dihydropyranyl, methyltetrahydropyranyl, dioxanyl, dioxolanyl, dithiolanyl, dihydrothiopyranyl, tetrahydrothiopyranyl, dimethyldihydropyranyl, tetrahydrofuranyl and dimethyldihydrothiopyranyl, and Z is hydrogen or methoxycarbonyl, or a salt thereof.

2. A process for combating the growth of unwanted plants, wherein the plants or the soil are treated with a cyclohexanedione derivative of the formula



I

where $R^1$ is alkyl of 1 to 4 carbon atoms, $R^2$ is alkyl of 1 to 4 carbon atoms, alkenyl of 3 or 4 carbon atoms, alkynyl of 3 or 4 carbon atoms or haloalkenyl of 3 or 4 carbon atoms and 1 to 3 halogen atoms, X is straightchain or branched alkylene of 1 to 5 carbon atoms, which is unsubstituted or substituted by phenyl, n is 0 or 1, Y is, selected from the group consisting of tetrahydropyranyl, dihydropyranyl, methyltetrahydropyranyl, dioxanyl, dioxolanyl, dithiolanyl, dihydrothiopyranyl, tetrahydrothiopyranyl, dimethyldihydropyranyl, tetrahydrofuranyl and dimethyldihydrothiopyranyl, and Z is hydrogen or methoxycarbonyl, or a salt thereof.

**4,422,865**

## IMIDES DERIVED FROM 2-THIOXO-3-(BENZOX (THIA) AZOLINE ACETIC AND PROPIONIC ACIDS

**John J. D'Amico, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.**

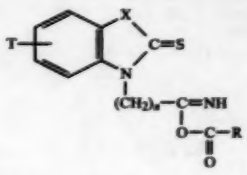
**Division of Ser. No. 223,637, Jan. 9, 1981, Pat. No. 4,362,547, which is a division of Ser. No. 55,102, Jul. 5, 1979, Pat. No. 4,289,886. This application Jan. 7, 1982, Ser. No. 337,793**

**The portion of the term of this patent subsequent to Jan. 29, 1997, has been disclaimed.**

**Int. Cl.³ C07D** *277/68;* **A01N** *43/78*

**U.S. Cl. 71—90** **10 Claims**

1. A method of regulating the growth of desirable leguminous plants which comprises applying to the plant locus a plant growth regulating effective amount of a compound having the formula



wherein X is oxygen or sulfur, R is lower alkyl, T is selected from the group consisting of hydrogen, halogen, nitro, lower alkyl and trifluoromethyl and n is 1 or 2.

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**4,422,866**

## ANTIDOTES FOR PROTECTING PLANTS FROM HERBICIDE DAMAGE

**Hans-Jochem Riebel, Wuppertal; Ludwig Eue, Leverkusen, and Wilfried Faust, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

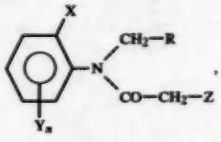
**Filed Jul. 7, 1980, Ser. No. 166,279**

**Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930448**

**Int. Cl.³ A01N** *25/32*

**U.S. Cl. 71—92** **11 Claims**

1. Method of protecting maize from damage by herbicidally effective acetanilide of the general formula



(V)

in which

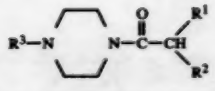
R represents pyrazol-1-yl,

X and Y are identical or different and represent alkyl with 1 to 4 carbon atoms,

Z represents chlorine and

n represents 0, 1 or 2,

which method comprises applying to the plants or to their habitat an antidotally effective amount of an N,N'-disubstituted piperazine compound of the general formula



(I)

wherein

$R^1$ is alkyl with 1 to 4 carbon atoms or chlorine,
$R^2$ is chlorine and
$R^3$ is phenyl, substituted phenyl wherein the substituents are selected from alkyl or alkoxy of from 1 to 4 carbon atoms, chlorine, fluorine, trifluoroethyl, nitro and alkanoyl with up to 4 carbon atoms or
$R^3$ is benzyl, 2-phenylethyl or 1-phenylethyl.

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**4,422,867**

**HERBICIDALLY ACTIVE UNSATURATED ESTERS OF HALOGENATED α-[4-(PYRIDYL-2'-OXY)-PHENOXY]-PROPIONIC ACIDS**

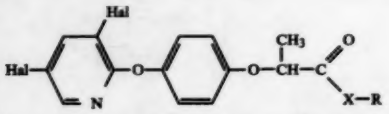
**Beat Böhner; Hermann Rempfler, and Rolf Schurter, all of Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Division of Ser. No. 2,923, Jan. 12, 1979, Pat. No. 4,300,944. This application Jul. 2, 1981, Ser. No. 279,505**

**Int. Cl.³ A01N *43/40*; C07D *213/36***

**U.S. Cl. 71—094** **6 Claims**

1. A compound of the formula



wherein each Hal is chlorine or bromine; X is oxygen or sulfur; and R is $C_1$–$C_5$ cyanoalkyl or 1-cyanocyclohexyl(1).

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**4,422,868**

**HERBICIDAL 4-TRIFLUOROMETHYL-4-NITRODIPHENYL ETHERS**

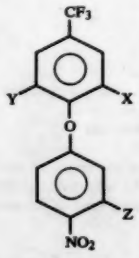
**Horst O. Bayer, Levittown; Colin Swithenbank, Perkasie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**Division of Ser. No. 111,560, Jan. 14, 1980, Pat. No. 4,330,324, which is a division of Ser. No. 881,227, Feb. 22, 1978, Pat. No. 4,220,468, which is a division of Ser. No. 719,484, Aug. 31, 1976, Pat. No. 4,093,446, which is a continuation-in-part of Ser. No. 617,560, Sep. 29, 1975, Pat. No. 4,063,929, and a continuation-in-part of Ser. No. 617,562, Sep. 29, 1975, Pat. No. 4,064,798, said Ser. No. 617,560, is a continuation-in-part of Ser. No. 331,719, Feb. 12, 1973, Pat. No. 3,928,416, said Ser. No. 617,562, is a division of Ser. No. 331,719, Feb. 12, 1973, which is a continuation-in-part of Ser. No. 234,651, Mar. 14, 1972, Pat. No. 3,798,276. This application Sep. 16, 1981, Ser. No. 302,922**

**Int. Cl.³ A01N *39/00, 37/34*; C07C *121/75, 149/00***

**U.S. Cl. 71—98** **12 Claims**

1. A compound of the formula



wherein
X is a hydrogen atom, a halogen atom, a trifluoromethyl group, or a ($C_1$–$C_4$)alkyl group,
Y is a hydrogen atom, a halogen atom, or a trifluoromethyl group, and
Z is a cyano group or a ($C_1$–$C_4$)alkylthio group.

9. A method of controlling weeds which comprises applying to the surface of the growth medium prior to the emergence of the weeds from the growth medium a compound according to claim 1 in an amount sufficient to control the growth of the weeds.

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**4,422,869**

**HALOGENATED ALLYLTHIOISOPROPYL N-METHYLCARBAMATES AS HERBICIDE EXTENDERS**

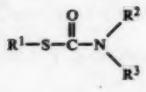
**Daniel L. Hyzak, Saratoga, and Ferenc M. Pallos, Walnut Creek, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.**

**Filed Apr. 20, 1981, Ser. No. 255,209**

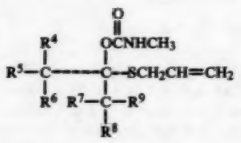
**Int. Cl.³ A01N *37/02***

**U.S. Cl. 71—100** **18 Claims**

1. An herbicidal composition of extended soil life comprising
(a) an herbicidally effective amount of a thiolcarbamate having the formula



in which $R^1$, $R^2$, and $R^3$ are independently $C_2$–$C_4$ alkyl; and
(b) an amount of a halogenated allylthioisopropyl N-methylcarbamate sufficient to extend the soil life of said thiolcarbamate, said N-methylcarbamate having the formula



in which $R^4$, $R^5$, $R^6$, $R^7$, $R^8$, and $R^9$ are independently halogen, and
(c) an inert diluent carrier, wherein the weight ratio of (a) to (b) ranges from about 1:1 to about 1:20.

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**4,422,870**

**BIOCIDAL 2-ARYL-1, 3-CYCLOHEXANEDIONE ENOL ESTER COMPOUNDS**

**Thomas N. Wheeler, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.**

**Filed Mar. 28, 1977, Ser. No. 781,781**

**The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.**

**Int. Cl.³ A01N *37/02*; C07C *69/24***

**U.S. Cl. 71—106** **10 Claims**

1. 3-(2-Ethylhexanoyloxy)-5,5-dimethyl-2-(2',4'-dimethylphenyl)-2-cyclohexenone.

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**4,422,871**

**ARALKYLPHENYLUREAS AND HERBICIDES CONTAINING THESE**

**Ulrich Schirmer, Heidelberg; Wolfgang Rohr, Wachenheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

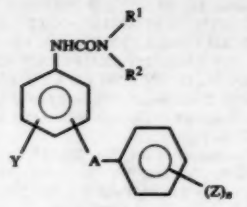
**Division of Ser. No. 268,120, May 28, 1981. This application May 7, 1982, Ser. No. 376,181**

**Claims priority, application Fed. Rep. of Germany, Jun. 2, 1980, 3020869**

**Int. Cl.³ A01N *47/30*; C07C *83/10, 87/50, 103/30***

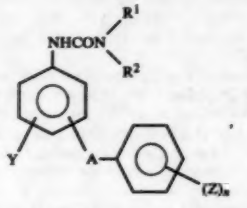
**U.S. Cl. 71—120** **3 Claims**

1. An aralkylphenylurea of the formula



wherein A is n-propylene or n-butylene, $R^1$ is methyl, $R^2$ is methyl or methoxy, Y is hydrogen or chlorine, Z is hydrogen or alkyl of 1 to 4 carbon atoms and n is 1.

2. A process for combating the growth of unwanted plants, wherein the plants or the soil are treated with a herbicidally effective amount of an aralkylphenylurea of the formula



wherein A is n-propylene or n-butylene, $R^1$ is methyl, $R^2$ is methyl or methoxy, Y is hydrogen or chlorine, Z is hydrogen or alkyl of 1 to 4 carbon atoms and n is 1.

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**4,422,872**

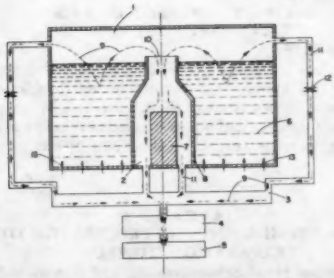
## METHOD OF HEATING, MELTING, AND COAL COVERSION AND APPARATUS FOR THE SAME

**Ernest S. Geskin, 21 Karen Pl., Edison, N.J. 08817**

**Filed Oct. 14, 1980, Ser. No. 196,265**

**Int. Cl.³ C21C *7/00***

**U.S. Cl. 75—51** **5 Claims**



1. A method of heating, melting and coal conversion in a vessel comprising inner and outer chambers separated from one another by a refractory wall, the method comprising the steps of

depositing a melt in the outer chamber, the melt being a melt selected from the group consisting of a metal, metal oxides and nonmetal oxides;

injecting coal, air, oxygen, steam, fluxes, hot flue gases and slag into the melt;

maintaining the melt temperature and composition so as to insure an absorption of oxygen of the injected air and of the injected oxygen and to thereby produce oxides, and reduction of the oxides produced during the absorption, by the injected coal;

accomodating a material to be heated in the inner chamber so that the melt flows around the refractory wall and heat through the latter the material in the inner chamber; and

continuously withdrawing combustion products from the outer chamber and passing the combustion products through the inner chamber.

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**4,422,873**

## BLOWING METHOD IN A TOP AND BOTTOM BLOWING CONVERTER

**Hirosuke Yamada, and Hisashi Omori, both of Kurashiki, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan**

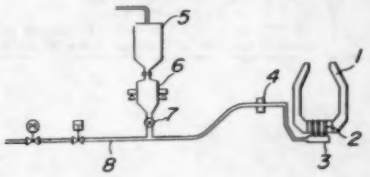
**PCT No. PCT/JP81/00205, § 371 Date Apr. 30, 1982, § 102(e) Date Apr. 30, 1982, PCT Pub. No. WO82/00835, PCT Pub. Date Mar. 18, 1982**

**PCT Filed Aug. 31, 1981, Ser. No. 380,667**

**Claims priority, application Japan, Aug. 30, 1980, 55-119008**

**Int. Cl.³ C21C *5/34, 5/36***

**U.S. Cl. 75—52** **3 Claims**



1. A method of blowing a molten steel in a top and bottom blowing converter, comprising blowing lime powder into the converter through tuyeres arranged on the bottom thereof according to such a blowing pattern at the initial stage of the blowing, said initial stage being from the beginning of the blowing to the completion of desiliconization, that the lime powder is blown into the converter in an amount satisfying the following formula

$$(CaO/SiO_2)^{-1} \times SiO_2 \text{ (kg/t)} \leq 13 \text{ (kg/t)}$$

depending upon the basicity of slag and the amount of $SiO_2$ formed in the converter during the initial stage of the blowing.

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**4,422,874**

## GOLDEN SINTERED ALLOY FOR ORNAMENTAL PURPOSE

**Tomio Nishimura; Hiraku Yoshino; Kosei Takao, and Yuuji Masumoto, all of Fukuoka, Japan, assignors to Nippon Tungsten Co., Ltd., Fukuoka, Japan**

**Filed Jan. 6, 1982, Ser. No. 337,223**

**Claims priority, application Japan, Oct. 9, 1981, 56-161146; Oct. 9, 1981, 56-161147; Oct. 9, 1981, 56-161148**

**Int. Cl.³ B22F *1/00***

**U.S. Cl. 75—238** **2 Claims**

1. Gold colored sintered alloy for ornamental purposes consisting essentially of:

30–80 percent by weight of niobium carbide, 10–40 percent by weight of titanium nitride and 10–30 percent by weight of nickel.

## 4,422,875
## FERRO-SINTERED ALLOYS

Tohru Nakata, Matsudo; Hiroyuki Endo, Abiko; Masatoshi Harada; Tadao Hayasaka, both of Kashiwa, and Osamu Miyamoto, Matsudo, all of Japan, assignors to Hitachi Powdered Metals Co., Ltd., Japan

Filed Feb. 25, 1981, Ser. No. 237,906
Claims priority, application Japan, Apr. 25, 1980, 55-54316; Sep. 5, 1980, 55-60609
Int. Cl.³ B22F 5/00
U.S. Cl. 75—243 1 Claim

1. A ferro-sintered alloy having wear resistance at elevated temperatures, comprising a perlite matrix having a copper content of 0.2 to 1.5 weight %, in which are dispersed 10 to 50 weight % of a phase A rich in heat- and corrosion-resistance and having the following composition and 2 to 15 weight % of at least one selected from the group consisting of four phases B rich in wear resistance and having the following composition:

| | |
|---|---|
| Phase A | Cr 9~20% (by weight)<br>Ni 6~15% (by weight)<br>Mo 1.5~9.5% (by weight)<br>W 1.5~9.5% (by weight)<br>Cu 0.7~4.5% (by weight)<br>Fe the remainder |
| Phase B | 50~70% Mo—Fe Alloy (by weight)<br>50~70% Cr—Fe Alloy (by weight)<br>45~60% Fe—33~36% Mo—Si Alloy (by weight)<br>45~60% Co—33~36% Mo—Si Alloy (by weight) |

## 4,422,876
## METHOD FOR PREPARING PLUGGING MATERIAL

Nikolai I. Nikolaev, V.O. 5 linia, 18, kv. 9; Lev A. Tereschenko, ulitsa Gurdina, 5, kv. 34; Arian M. Yakovlev, Grazhdansky prospekt, 5, korpus 1, kv. 210; Vitaly I. Kovalenko, ulitsa Esenina, 40, korpus 1, kv. 160, all of Leningrad; Ruben A. Tatevosian, ulitsa Gorkogo, 4, kv. 60; Mikhail Y. Titov, ulitsa Kominterna, 34/6, kv. 83, both of Moscow, and Nikolai K. Lipatov, ulitsa Zinovieva, 2, kv. 96, Apatity, Murmanskaya oblast, all of U.S.S.R.

Filed Jan. 28, 1982, Ser. No. 343,509
Claims priority, application U.S.S.R., Apr. 27, 1981, 3270006
Int. Cl.³ C04B 7/32
U.S. Cl. 106—104 1 Claim

1. A method for preparing a body of plugging material of an alumina-base cement for in-situ cubic expansion on application of water thereto, comprising the steps of mechanically stirring dry alumina cement having dry additives of prerated quantities to improve the physical and mechanical characteristics of the plugging material, said stirring being effected by magnetized working bodies in an alternating electromagnetic field thereafter batch forming said stirred material into a body of determined shape conforming substantially to the body desired for in-situ application, and subsequently compressing said shaped body from all sides at a pressure of between 50 and 120 $MN/m^2$ to obtain a further compacted body.

## 4,422,877
## SYNTHETIC POLYMER-PROPELLANT COMPOSITIONS FORMING COLD FOAMED STRUCTURES HAVING A TEMPERATURE AT LEAST 30° C. BELOW AMBIENT TEMPERATURE AND CONTAINING OPEN AND/OR CLOSED CELLS

J. George Spitzer, Palm Beach, Fla., and Lloyd I. Osipow, New York, N.Y., assignors to Restech Research Limited Partnership, New York, N.Y.

Continuation-in-part of Ser. No. 200,847, Oct. 28, 1980, abandoned, and Ser. No. 308,054, Oct. 2, 1981, abandoned. This application Feb. 4, 1982, Ser. No. 345,833
Int. Cl.³ C08J 9/14
U.S. Cl. 106—122 18 Claims

1. A synthetic polymer-liquefied propellant composition capable of forming a cold foamed structure having a temperature at least 30° C. below the ambient temperature at which the cold foamed structure is formed, and containing open and/or closed cells, which may contain an additive which is deposited in the pores and/or walls of the foamed structure as the foamed structure is formed, comprising, as the essential ingredients:

(a) a film-forming synthetic polymer in an amount within the range from about 2% to about 30% by weight of the composition;

(b) at least one liquefied propellant boiling below −10° C.;

(c) the total propellant being in an amount within the range from about 50% to about 90% by weight of the composition; and having a heat vaporization of at least 55 calories per gram; the propellant being capable of dissolving the synthetic polymer at least in the presence of a co-solvent that is soluble in the propellant and in solutions of the synthetic polymer in the propellant at ambient temperature; and

(d) at least one nonsolvent that is soluble in the propellant but in which the synthetic polymer is insoluble in an amount within the range from about 1% to about 85% by weight of the composition;

the composition forming on volatilization of propellant at ambient temperature a coherent foamed structure containing open and/or closed cells, and having a temperature at least 30° C. below ambient temperature.

## 4,422,878
## ASPHALT COMPOSITIONS

Frank R. Fry, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Nov. 29, 1982, Ser. No. 445,115
Int. Cl.³ C08L 91/00, 95/00
U.S. Cl. 106—219 5 Claims

1. An asphalt composition containing a reinforcing amount up to about 10% by weight of fibrous filler and (b) a fatty acid portion comprising a mixture of about 2.5 to 15% by weight of straight chain eighteen carbon unsaturated fatty acid and rosin in an active amount not exceeding about 30% by weight of the acid.

## 4,422,879
## PAPER SIZING AGENT AND PROCESS FOR THE PREPARATION THEREOF

Guenter Poppel; Horst Schuermann, both of Dueren, and Gabriel Falkenberg, Vettweiss, all of Fed. Rep. of Germany, assignors to Akzona, Inc., Asheville, N.C.

Continuation of Ser. No. 143,987, Apr. 28, 1980, abandoned. This application Jul. 26, 1982, Ser. No. 402,189
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 2917439
Int. Cl.³ C08L 93/04
U.S. Cl. 106—238 12 Claims

1. In an improved inversion process for the preparation of a paper sizing agent which is an aqueous dispersion containing a high content of free rosin in the form of fortified rosin and/or non-fortified rosin, water, and an anionic dispersing agent, the

improvement comprising using as the dispersing agent a polyethoxylated, sulfated rosin, or a derivative thereof, in an amount from about 1 to about 10%, based on the total weight of all solids in the dispersion.

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**4,422,880**

## PRECIPITATED SILICEOUS PRODUCTS

**Satish K. Wason, Havre de Grace, Md., assignors to J. M. Huber Corporation, Locust, N.J.**

**Continuation of Ser. No. 39,062, May 11, 1979, abandoned, which is a division of Ser. No. 876,284, Feb. 9, 1978, abandoned, which is a continuation of Ser. No. 557,707, Mar. 12, 1975, abandoned. This application Jun. 30, 1981, Ser. No. 279,285**

**The portion of the term of this patent subsequent to Jul. 6, 1993, has been disclaimed.**

**Int. Cl.³ C09C *1/30*; C01B *33/12***

**U.S. Cl. 106—288 B** **1 Claim**

1. A new composition of matter comprising a finely divided, amorphous, precipitated silicon dioxide having a wet cake moisture content of from between about 77.9 to 83.2%; a structure index of from between about 365 to 495; an oil absorption of from between about 193 to 212 cc/100 grams; a void volume of from between about 3.19 to 4.40 cc Hg/gram $SiO_2$; a BET surface area of from between about 153 to 220 $m^2$/gram; and a percent friability of up to about 93%; said silicon dioxide comprising at least 90% $SiO_2$ and having incorporated therewith a metal cation selected from the group consisting of aluminum, magnesium, zinc, and calcium to thereby control the surface area thereof and to increase the refractive index thereof to a value of at least 1.45.

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**4,422,881**

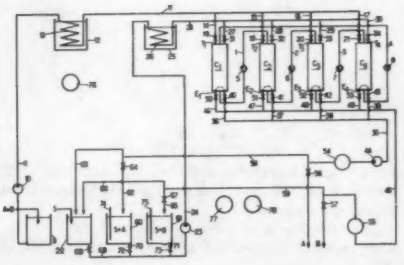
## INSTALLATION AND PROCESS FOR THE CONTINUOUS SEPARATION OF MIXTURES OF SUGARS AND/OR OF POLYOLS BY SELECTIVE ADSORPTION

**Francis Devos, Hazebrouck; Didier Delobeau, Merville; Jean-Jacques Caboche, Lestrem; Patrick Lemay, Estaires, and Michel Huchette, Merville, all of France, assignors to Roquette Freres, Lestrem, France**

**Filed Oct. 29, 1980, Ser. No. 201,832**

**Int. Cl.³ C13D *3/14***

**U.S. Cl. 127—46.1** **3 Claims**



1. A process for the continuous separation by selective adsorption of mixtures of sugars and/or polyols which comprises initiating successive feeding/extraction sequences $S_1$, $S_2$, $S_3$, the first sequence $S_1$ comprising:

feeding the said mixture to an installation comprised of at least three columns each filled with adsorbent material, said installation of columns making up an adsorbent zone containing elution solvent, an enrichment zone, and a desorption zone, means successively communicating the outlet or extraction side of each zone with the inlet or top or head of the following one, closure means being located in the means communicating each zone with the following one,

closing the closure means located directly upstream the desorption zone to prevent communication between the adsorption zone and the desorption zone and opening the other closure means,

continuously feeding to the adsorption zone the mixture to be separated comprising at least a first more adsorbed and a second less adsorbed sugar or polyol, said feeding of the mixture displacing elution solvent in said adsorption zone, continuously feeding elution solvent to said desorption zone and continuously withdrawing from the bottom of said desorption zone, the first more adsorbed sugar or polyol of said mixture in said elution solvent,

simultaneously, extracting from the adsorption zone the elution solvent during a first part of the sequence until the elution solvent is substantially displaced and then withdrawing the second less adsorbed sugar or polyol fom said adsorption zone during a second part of the $S_1$ sequence.

initiating a second sequence feeding/extraction ($S_2$) comprising closing the closure means in the means communicating the previous desorption and enrichment zone and opening the other closure means whereby the desorption zone of sequence $S_1$ becomes the adsorption zone to which is fed the mixture to be separated, the enrichment zone of sequence $S_1$ becomes the desorption zone to which is fed the elution solvent and the adsorption zone of sequence $S_1$ becomes the enrichment zone,

thus repeating the feeding and extraction steps recited above utilizing the newly designated zones to initiate a third sequence $S_3$ and so on.

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**4,422,882**

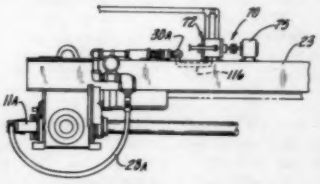
## PULSED LIQUID JET-TYPE CLEANING OF HIGHLY HEATED SURFACES

**John E. Nelson; Charles W. Hammond; Rolland E. Huston, all of Lancaster, and Michael R. Helton, Englewood, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.**

**Filed Dec. 29, 1981, Ser. No. 335,351**

**Int. Cl.³ B08B *3/02***

**U.S. Cl. 134—22.18** **9 Claims**




1. The method of dislodging an adherent coating from the coated area of the heated surface of a heat exchanger or the like, which comprises projecting a high velocity liquid jet in the form of a plurality of discrete pulses against the coated area in a predetermined spacing and sequence, moving the jet over the coating at a controlled rate of progression, and forming said pulses by interrupting the jet with a frequency high enough to cause the leading portion of at least one pulse to strike the coating during each increment of movement of the jet which corresponds to the diameter of the jet at the position of impact, the duration of interruption being long enough to permit the liquid of each pulse to substantially dissipate from an area impacted thereby before a succeeding pulse strikes the same area.

2. A method as defined in claim 1 wherein the liquid is projected through a lance tube which is moved both longitudinally of and angularly about its axis to cause the positions of impact of the pulses on the coated area to progress at a con-

trolled rate along a predetermined path, the frequency of the pulses lying outside the range of natural frequencies of oscillation of the lance tube.

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**4,422,883**

## METHOD FOR REMOVING CYANOACRYLATE ADHESIVES FROM SURFACES

**Warren G. Lazar, 8401 N. Rancho Catalina Dr., Tucson, Ariz. 85704**

**Continuation of Ser. No. 293,872, Aug. 18, 1981, Pat. No. 4,381,248. This application Sep. 30, 1982, Ser. No. 430,798**

**Int. Cl.³ B08B *3/08***

**U.S. Cl. 134—38** **6 Claims**

1. The method of removing a cyanoacrylate adhesive from a surface to which it has been bonded consisting essentially of applying to the surface a composition which comprises acetonitrile in sufficient concentration to dissolve the bond between the adhesive and the surface, and removing the adhesive from the surface, after the application of said composition.

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**4,422,884**

## METHOD OF TREATING A CONTINUOUSLY CAST STRAND FORMED OF STAINLESS STEEL

**David P. Vickers; Kenneth Mayland, both of Sheffield, and Gordon K. Allan, Rotherham, all of England, assignors to Concast AG, Zurich, Switzerland**

**Filed Oct. 16, 1978, Ser. No. 951,997**

**Claims priority, application United Kingdom, Oct. 20, 1977, 43724/77**

**Int. Cl.³ C21D *8/00***

**U.S. Cl. 148—2** **11 Claims**

1. A method of treating a continuously cast strand formed of stainless steel, comprising the steps of:

casting a continuously cast strand of stainless steel;

passing the cast strand through oppositely situated rollers of a plurality of opposed rollers;

deforming the surface layer of oppositely situated sides of the strand prior to cutting of the strand by means of the oppositely situated rollers of said plurality of opposed rollers, in order to store energy in the surface layer of said oppositely situated sides of the strand and to concentrate the deformation at the strand surface;

subsequently heating the strand; and

thus producing by the deformation and subsequent heating a recrystallized marginal zone of more than three millimeters thickness at each of the oppositely situated deformed sides of the case strand.

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**4,422,885**

## POLYSILICON-DOPED-FIRST CMOS PROCESS

**Ronald W. Brower, Kettering; Samuel Y. Chiao, West Carrollton; Robert F. Pfeifer, Centerville, and Roberto Romano-Moran, Centerville, all of Ohio, assignors to NCR Corporation, Dayton, Ohio**

**Filed Dec. 18, 1981, Ser. No. 332,037**

**Int. Cl.³ H01L *21/22, 29/78, 11/14***

**U.S. Cl. 148—1.5** **1 Claim**

1. A process for forming a CMOS device from a structure comprising a body of n-type semiconductor material having first and second active regions, respectively, with a p-well formed in the first active region, and a 300-700 Angstroms thin silicon dioxide layer formed over said body encompassing a gate region within each of said active regions, said process consisting of:

forming a polysilicon layer doped with n-type impurities over the thin silicon dioxide layer formed in said first and second active regions;

forming an oxide mask over the polysilicon defining gates and interconnecting conductors;

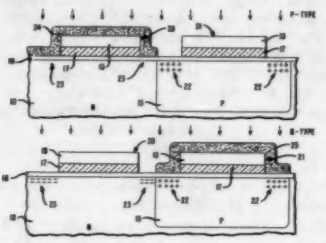
patterning the polysilicon in the presence of the oxide mask into gates corresponding to the gate regions and interconnecting conductors;

forming a first photoresist mask over the second active region;

implanting n-type impurities in source and drain regions defined in the first active region by the oxide mask;

removing said first photoresist mask;

forming a second photoresist mask over the first active region;



implanting p-type impurities in source and drain regions defined in the second active region by the oxide mask;

whereby said device has all n-type gates and interconnecting conductors of a single conductivity and is free of dopant penetration from said gates into said substrate via said thin silicon dioxide layer.

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**4,422,886**

## SURFACE TREATMENT FOR ALUMINUM AND ALUMINUM ALLOYS

**Narayan Das, Westmont, and Joy M. Schaefer, Park Ridge, both of Ill., assignors to Chemical Systems, Inc., Chicago, Ill.**

**Division of Ser. No. 343,992, Jan. 29, 1982, Pat. No. 4,391,652. This application Mar. 16, 1983, Ser. No. 475,911**

**Int. Cl.³ C23F *7/06***

**U.S. Cl. 148—31.5** **8 Claims**

1. An aluminum or aluminum alloy surface obtained by contacting said surface with a coating solution consisting essentially of at least about 0.025 grams/liter of zirconium, at least about 0.050 grams/liter of fluoride ion, at least about 0.025 grams/liter of nickel and sufficient acid to adjust the pH to the range of about 1.2 to about 2.5.

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**4,422,887**

## HEAT TREATMENT

**Donald F. Neal, Tamworth, and Paul A. Blenkinsop, Sutton Coldfield, both of England, assignors to IMI Kynoch Limited, Birmingham, England**

**Filed Aug. 18, 1981, Ser. No. 293,960**

**Claims priority, application United Kingdom, Sep. 10, 1980, 8029075**

**Int. Cl.³ C22F *1/18***

**U.S. Cl. 148—133** **3 Claims**

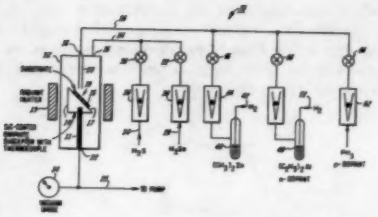
1. A method of heat treating a titanium base alloy containing by weight 5.5% aluminum, 3.5% tin, 3% zirconium, 1% niobium, 0.25% molybdenum, 0.3% silicon which includes the steps of solution treating the alloy at a temperature in the range 1030° C. to 1070° C. and then heat treating the alloy at a temperature of 435° to 635° C. and without mechanically working the alloy giving the alloy a second heat treatment at a higher temperature than the first heat treatment at a temperature of 600° to 700° C. wherein the duration of the first heat treatment is 2 to 168 hours.

4,422,888

## METHOD FOR SUCCESSFULLY DEPOSITING DOPED II-VI EPITAXIAL LAYERS BY ORGANOMETALLIC CHEMICAL VAPOR DEPOSITION

Wolfgang E. Stutius, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 27, 1981, Ser. No. 239,080
Int. Cl.³ H01L *21/365, 29/22*
U.S. Cl. 148—175 9 Claims



1. A method of depositing a doped epitaxial layer of a II-VI compound on the surface of a substrate in a deposition zone of a reactor of an organometallic chemical vapor deposition system comprising the steps of heating the deposition zone of the reactor to a temperature in the range of about 300° C. to 400° C. to produce pyrolytic action that provides sufficient surface mobility of the compound to be deposited to form a smooth epitaxially deposited layer, the temperature employed in said range being not so high as to produce a substantial concentration of native intrinsic defects, said defects being comparatively smaller in number relative to the number of electrically active doners therein, introducing into the reactor a gas phase composition containing a gaseous mixture of a reactant having a Group II containing component, a reactant having a Group VI containing component and a dopant selected from the Group III for n-type dopant or from the Group V for the p-type dopant, said step of introducing characterized by one of the gas phase reactants thereof and said selected dopant being initially introduced in close proximity to the substrate surface in the deposition zone whereas other gas phase reactants are introduced directly into the reactor proper.

selecting a low pressure environment in the range of about 10 mTorr to 200 mTorr in the reactor, said selection sufficient to suppress the probability of the gas phase pyrolytic reaction of said mixture prior to deposition thereof on the substrate.

forming said epitaxial layer by contacting the substrate with the introduced mixture in the deposition zone causing the pyrolyzation and deposition on the substrate of an elemental II and VI compound with a predetermined doping concentration.

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4,422,889

## METHOD OF MANUFACTURING AN OPTICAL FIBRE CABLE

Jean-Pierre Trezeguet, and Jean-Patrick Vives, both of Calais, France, assignors to Les Cables De Lyon, Clichy, France

Filed Nov. 17, 1981, Ser. No. 322,128
Claims priority, application France, Nov. 20, 1980, 80 24628
Int. Cl.³ B32B *3/00*; B65H *5/00*; G02B *5/16*
U.S. Cl. 156—70 2 Claims

1. A method of manufacturing an optical fibre cable comprising the steps of:

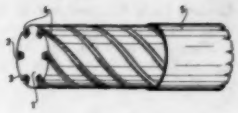
filling helical grooves formed about the periphery of a generally cylindrical elongate central support structure with a compound which is viscous at cable operation temperature to an intermediate level while in a viscous state;

cooling said support structure and said viscous compound to reversibly harden said compound partially filling said grooves;

laying optical fibres in said grooves over said hardened compound while said compound is maintained at a temperature below its hardening temperature to locate said fibres at the intermediate depth; and

filling the balance of the grooves with the said viscous compound at a temperature above its hardening temperature; and

covering said support structure with its filled-in grooves with a sheet to retain the fibres in the grooves at their intermediate depth position such that, when at higher operation temperatures the compound returns to its viscous state with the fibres remaining at the level they occupied as originally laid in the grooves, unless there is a strain differential between the optical fibres and the support to permit the fibers to sink deeper within the grooves to satisfy tractive stresses which elongate the support structure.



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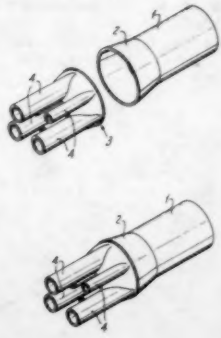
4,422,890

## PROCESS FOR THE MANUFACTURE OF DIMENSIONALLY RECOVERABLE ARTICLES

Richard J. Penneck, Lechlade, England, assignor to Raychem Limited, London, England

Filed Apr. 28, 1981, Ser. No. 258,310
Claims priority, application United Kingdom, May 15, 1979, 7916725; May 3, 1980, 8014927
Int. Cl.³ B29C *27/00*; B32B *31/00*; B32C *13/00*; F16L *1/00*
U.S. Cl. 156—73.5 10 Claims



1. A process for the manufacture of an article that is dimensionally-heat-recoverable, which comprises the steps of forming a plurality of shaped component parts of the article from a polymeric material, assembling the component parts to form a hollow article, said article having at least one outlet and having internal lateral dimensions that are greater than the lateral dimensions of the or any outlets, bonding the component parts

together, cross-linking the polymeric material after the component parts have been bonded together and then applying heat to expand at least a portion of the article to bring that portion of the article to a temperature above its crystalline melting point, or, for amorphous materials, the softening point of the polymer.

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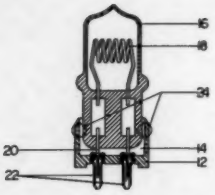
**4,422,891**

## VITRIFIABLE ADHESIVE PROCESS

**Donald I. Gonser, York, Pa., assignor to Dentsply Research & Development Corporation, Milford, Del.**

**Filed Jun. 16, 1981, Ser. No. 274,065**
**Int. Cl.³ B32B** *31/26;* **C04B** *37/00, 39/00*
**U.S. Cl. 156—89** **29 Claims**




1. A method of adhering a first article to a second article comprising:

contacting each of said articles with a polymerizable adhesive comprising:

at least about 25% by weight of said adhesive of an inorganic particulate filler, and

a polymerizable resin comprising at least about 0.25% by weight of said adhesive of a polymerizable silane,

polymerizing said adhesive to adhere said objects together, and

heating said polymerizable adhesive at a temperature and for a time sufficient to drive off or vaporize volatile organic components of the polymerized adhesive to effect vitrification thereof.

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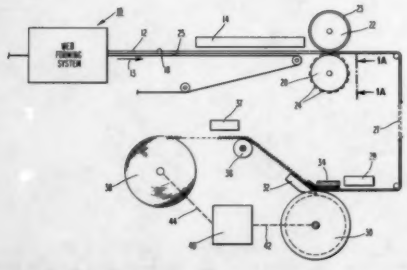
**4,422,892**

## METHOD OF MAKING A BONDED CORRUGATED NONWOVEN FABRIC AND PRODUCT MADE THEREBY

**Derek Plant, Runnemede, N.J., assignor to Scott Paper Company, Philadelphia, Pa.**

**Filed May 4, 1981, Ser. No. 260,507**
**Int. Cl.³ B32B** *3/30, 3/02*
**U.S. Cl. 156—209** **11 Claims**




1. A method of making a corrugated, nonwoven fabric comprising the steps of:

(a) forming a web predominately of thermoplastic fibers;

(b) pattern embossing the web at an elevated temperature so as to form autogenous bonds extending through the web and in said pattern;

(c) creping the bonded web at an elevated temperature by pressing the web against a driven roll which feeds the web against a retarding member, said roll having grooves extending perpendicular to the axis of the roll;

(d) controlling the removal of the web from the retarding member so that the web is foreshortened in the driven direction by at least 40 percent and so that said grooves cause noticeable ridges to be formed in the web, said ridges extending in the driven direction of the web; and

(e) controlling the temperature of the web during the creping step so that some of the thermoplastic fibers are softened and the fabric tends to retain the crepe and ridges when the web cools.

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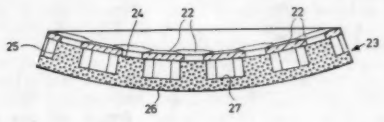
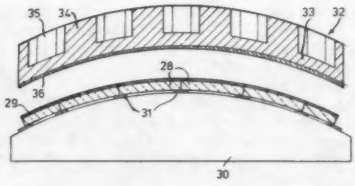
**4,422,893**

## METHOD OF MANUFACTURING MIRRORS AND MIRRORS SO OBTAINED

**Jacques Duchateau, Recquignies, and Maurice Nicolas, la Rabouliere, both of France, assignors to B F G Glassgroup, Paris, France**

**Continuation of Ser. No. 919,958, Jun. 28, 1978, abandoned. This application Apr. 15, 1980, Ser. No. 140,591**
**Claims priority, application United Kingdom, Jun. 28, 1977, 27026/77; Mar. 20, 1978, 27026/78**
**Int. Cl.³ B32B** *31/00, 3/14, 3/16;* **G02B** *5/08*
**U.S. Cl. 156—232** **20 Claims**




1. A method of manufacturing a curved mirror having a solar reflective surface of large area sufficient to concentrate solar energy for use as a solar reflective panel, said method comprising the steps of

selecting a former of large area and curved shape complementary to the large area and curved shape of the mirror solar reflective surface which is to be used for concentrating solar energy,

applying to such former a plurality of mirror elements in substantially juxtaposed relationship, to form a solar reflective surface each mirror element being constituted by a glass element having a reflective coating on one face thereof, and

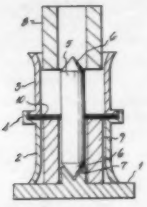
applying and adhesively bonding directly to the so positioned mirror elements a preformed substantially rigid unitary structural support of similar large area and curved shape made from material comprising expanded vitreous material.

4,422,894

## GASKET MANUFACTURE

Alan W. Atkinson, Rochdale, and Janet M. Lancaster, Desmley, both of England, assignors to T & N Materials Research Limited, Manchester, England

Filed Nov. 13, 1981, Ser. No. 321,230
Claims priority, application United Kingdom, Nov. 15, 1980, 8036727; Dec. 1, 1980, 8038419
Int. Cl.³ B32B *31/00, 17/00;* B28B *1/46*
U.S. Cl. 156—62.2 7 Claims



1. A method of making an annular expanded graphite gasket incorporating an annular metallic reinforcement layer which is enclosed within the annular gasket in relation to one edge thereof, the method comprising the step of pressing said gasket from relatively uncompacted expanded graphite particles onto the opposed faces of said metallic reinforcement layer substantially simultaneously between a pair of concentric rams including spacing means to define said one edge thereby forming compacted graphite foils in situ thereon, while at the same time pressing some of said particles relative to said one edge to form a single unreinforced graphite foil portion extending from and integral with the other foils to enclose said one edge.

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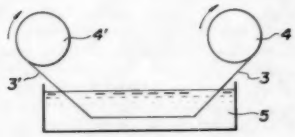
4,422,895

## METHOD OF PRODUCING A COMPRESSIBLE LAYER AND A BLANKET FOR PRINTING OPERATION

Haruo Shimura, and Takao Kawata, both of Saitama, Japan, assignors to Fujikura Rubber Ltd., Tokyo, Japan

Filed Jul. 18, 1983, Ser. No. 515,310
Claims priority, application Japan, Jul. 16, 1982, 57-122831; Jul. 16, 1982, 57-122832; Jul. 16, 1982, 57-122833
Int. Cl.³ B32B *5/18, 31/14;* B44C *1/22;* C03C *15/00*
U.S. Cl. 156—633 30 Claims



1. A method of producing a compressible layer to be utilized for a blanket for printing operation having compression stress in the range of 2.0 to 8.0 kg/cm$^2$ in terms of compressibility and peeling strength of 200 g/m or more, characterized in that said method comprises the following steps:

adding to elastomer compound of oil resistant polymer pulverized material having an average grain size in the range of 10 to 50 microns at a rate of 30 to 250 parts by weight relative to said elastomer compound of 100 parts by weight, said pulverized material being dissolvable in a certain effluent;

placing the elastomer compound with the pulverized material added thereto over a base fabric at a rate of coverage in the range of 100 to 1000 g/m$^2$ and subjecting to vulcanization so as to form a layered structure; and

immersing the layered structure in the effluent at a temperature ranging from room temperature to 100° C. for 3 minutes to 6 hours.

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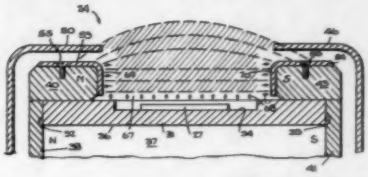
4,422,896

## MAGNETICALLY ENHANCED PLASMA PROCESS AND APPARATUS

Walter H. Class, Yonkers, N.Y.; Steven D. Hurwitt, Park Ridge, N.J.; Michael L. Hill, New York, N.Y., and Marvin K. Hutt, Oakland, N.J., assignors to Materials Research Corporation, Orangeburg, N.Y.

Filed Jan. 26, 1982, Ser. No. 342,976
Int. Cl.³ H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—643 16 Claims



1. A method of plasma processing which includes the steps of placing at least one substrate on a substrate support electrode positioned in a hermetic chamber, evacuating the chamber, introducing a reactant gas into the chamber, and applying a voltage to the substrate support, wherein the improvement comprises:

providing a magnetic field having lines of force which leave the support electrode, extend across the surface of the substrate exposed to the coating source, and re-enter the support to enclose said exposed surface in a magnetic electron-trapping field;

adjusting the voltage applied to the substrate support to produce a dense glow discharge closely adjacent to said substrate surface such that molecules of the reactant gas become ionized and are electrically attracted to the substrate; and

chemically reacting a selected material on the surface of the substrate with ions of the reactant gas.

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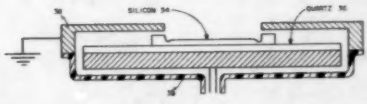
4,422,897

## PROCESS FOR SELECTIVELY ETCHING SILICON

Christopher M. Horwitz, Summer Hill, Australia, assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 25, 1982, Ser. No. 382,050
Int. Cl.³ H01L *21/306;* B44C *1/22;* B05D *5/12;* C03C *15/00*
U.S. Cl. 156—643 12 Claims



1. The process for selectively etching silicon in preference to a masking material on a surface of said silicon which comprises positioning a patterned masking material on said silicon, positioning said silicon on a target connected to a radio frequency electrode, introducing an etchant gas composition into said chamber under conditions to convert said etchant gas composition to a plasma, providing a source of oxygen and silicon to the interior of said chamber under conditions to deposit silicon dioxide selectively on said masking material layer and to etch silicon selectively from said silicon layer.

**4,422,898**

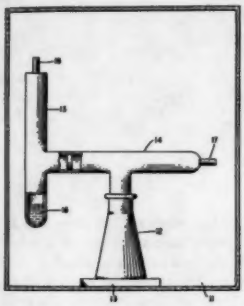
## TECHNIQUE FOR THE FABRICATION OF AN IRON OXIDE MASK

**John B. MacChesney, Stirling; Paul B. O'Connor, Plainfield, and Miles V. Sullivan, Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Continuation of Ser. No. 934,815, Aug. 18, 1978, abandoned, which is a continuation of Ser. No. 540,398, Jan. 13, 1975, abandoned, which is a continuation of Ser. No. 377,582, Mar. 2, 1973, abandoned, which is a continuation of Ser. No. 29,560, Apr. 17, 1970, abandoned. This application Jun. 2, 1982, Ser. No. 384,406**

**Int. Cl.³ B05D *5/06*; B41N *1/24***

**U.S. Cl. 156—655** **4 Claims**



4. In a method of fabricating a photomask, made up of a transparent substrate and a patterned layer thereon of a material relatively opaque to light of a wavelength used for exposing photoresists and relatively transparent to visible light of a higher wavelength, said method comprising the steps of depositing a metal oxide layer on the surface of said substrate and selectively etching said layer to form the required pattern, the improvement which comprises depositing iron oxide on said surface by decomposing iron pentacarbonyl at said surface in the presence of oxygen while the substrate is maintained at a temperature within the range of 100 degrees C. to 160 degrees C., within which the iron oxide layer is deposited in a form which is soluble in etchants compatible with photoresist processing.

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**4,422,899**

## APPARATUS AND METHOD FOR THE VAPORIZATION OF LIQUID

**Pentti Juhola, and Arvi Artamo, both of Espoo, Finland, assignors to Rintekno Oy, Espoo, Finland**

**PCT No. PCT/FI81/00004, § 371 Date Sep. 15, 1981, § 102(e) Date Sep. 15, 1981, PCT Pub. No. WO81/02112, PCT Pub. Date Aug. 6, 1981**

**PCT Filed Jan. 22, 1981, Ser. No. 305,628**

**Claims priority, application Finland, Jan. 24, 1980, 800216**

**Int. Cl.³ B01D *1/08, 1/10, 1/22***

**U.S. Cl. 159—13 B** **2 Claims**

1. A heat exchanger of the film vaporizer vertical tube type which comprises:

a shell or mantle having closed upper and bottom parts and a bank of tubes therein vertically supported by means of first and second tube-supporting end plates, with one plate located adjacent the bottom part of said mantle and defining an end space therewith, and the other end plate located adjacent the upper part thereof and defining an end space therewith, each of said end spaces being adapted to receive heat exchanger fluid therein for flowing through said tubes in heat exchanger relationship therewith,

a nozzle plate located intermediate said tube-supporting end plates and having openings therein through which said tubes pass,

said nozzle plate extending and contacting the inner walls of said mantle,

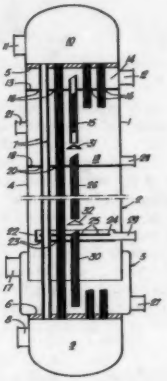
each of said openings defining with respect to the tube passing therethrough a film-forming nozzle for feeding liquid down and along the surface of said tube,

at least one nozzle basin spaced from said nozzle plate through which the tubes pass,

said basin similarly having nozzle openings through which the tubes pass which define with said tubes film-forming nozzles for feeding liquid down and along the surface of said tubes,

said at least one nozzle basin having a tube-support plate spaced from its bottom such as to be submerged in the liquid reservoir during operation of

said heat exchanger and thus assure a continuous flow of liquid film down along said tubes,



the nozzle basin tube-support plate also having openings therein between the spaced tubes passing through said plate,

said at least one nozzle basin having at least one overflow pipe for allowing excess liquid to overflow into said pipe down to another nozzle basin located below said at least one nozzle basin,

means for feeding heat exchange fluid into one of said end spaces of said mantle for passage through said tubes and out through the other end space of said mantle,

means for feeding liquid to be evaporated into the interior of the mantle in the space outside of said tubes onto a nozzle plate and onto at least one nozzle basin to provide a reservoir of said liquid for flowing through the nozzles surrounding the tubes and provide a liquid film flowing down and along the surface of said tubes for evaporation by heat exchange fluid flowing through each of said tubes,

and means by which the vapor formed from the liquid is removed from said mantle.

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**4,422,900**

## SPRAY DRYING APPARATUS FOR AVAILABLE CHLORINE-CONTAINING COMPOUNDS

**Kent J. Bordelon; Robert C. Eschenbacher, both of Lake Charles, La., and William H. Bridendall, Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.**

**Filed Nov. 25, 1981, Ser. No. 324,727**

**Int. Cl.³ B01D *1/14, 1/18***

**U.S. Cl. 159—48.1** **9 Claims**

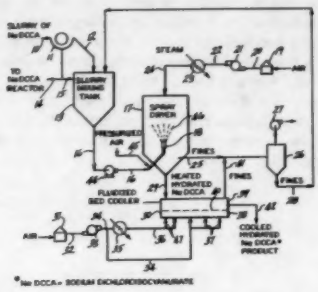
1. A process for preparing granular particles of an available chlorine compound which comprises:

a. conveying a flowing stream of an aqueous slurry of said compound under pressure through a tubular chamber hav-

ing a longitudinal axis parallel to the direction of flow of said slurry;

b. conveying said slurry to an exit port positioned in said tubular chamber;

c. discharging said aqueous slurry from said tubular chamber through said port into a zone of reduced pressure and enlarged area;




*No DCCA = SODIUM DICHLOROISOCYANURATE

d. conveying jets of atomizing medium into said exit port, thereby impinging said jets of atomizing medium into said slurry as it passes out of said exit port into said zone, whereby free expansion of said slurry into a cone of aerated droplets of said slurry is effected, and

e. contacting said droplets with heated gas in said zone to evaporate water from said droplets and produce dry granules of said compound.

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**4,422,901**

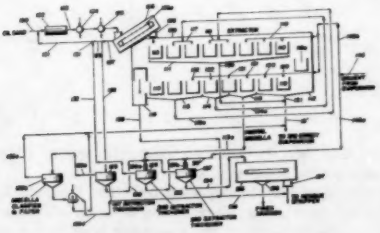
## APPARATUS FOR THE CONTINUOUS SOLVENT EXTRACTION OF BITUMEN FROM OIL-BEARING SAND

George B. Karnofsky, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 202,146, Oct. 30, 1980, abandoned, which is a division of Ser. No. 41,769, May 23, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 431,677

Int. Cl.³ B01D *11/02;* C10C *3/08*

U.S. Cl. 196—14.52 3 Claims



1. In an apparatus for the continuous extraction of bitumen from oil sand having means for continuously producing a feed slurry by mixing said oil sand and a miscella comprising solvent and bitumen, and a means for separating the feed slurry into an overflow stream having primarily finer particles of feed sand dispersed therein and an underflow stream having primarily coarse particles of feed sand dispersed therein and means for separately washing with solvent the sand in the underflow and overflow streams, the improvement comprising:

(a) means for washing the sand in said overflow stream by countercurrent decantation with solvent to produce a first miscella and spent fine sand;

(b) means for washing the sand in said underflow stream wherein the sand, confined in beds, is countercurrently washed by solvent, which percolates through the beds by gravity, to produce a second miscella and spent coarse sand, comprising a horizontally traveling conveyor with a continuous succession of strainer baskets arranged to receive, in turn, the underflow stream, stationary compartments under said baskets over which they travel which collect liquid draining from the baskets, sparger means arranged to discharge liquid into the baskets as they are carried beneath the sparger means by the conveyor, means for circulating liquid from some of the compartments to some of the sparger means, and means for removing from at least one of the compartments liquid comprising said second miscella;

(c) means for steam stripping solvent from the spent fine sand and the spent coarse sand;

(d) means for evaporation in which said first and second miscellas are separated into product bitumen and solvent; and

(e) means for recycling solvent recovered in said evaporation means and in said sand stripping means to both said means for washing sand.

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**4,422,902**

## METHOD OF OPERATING A COKE OVEN

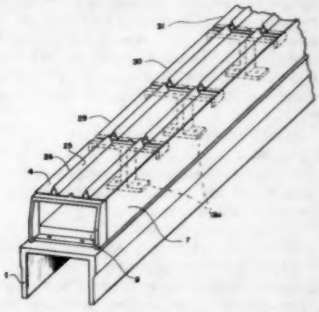
Dieter Breidenbach, Waltrop, and Wilhelm Moschach, Kamen-Methelen, both of Fed. Rep. of Germany, assignors to WSW Stahl-Und Wasserbau GmbH, Riphaushof, Fed. Rep. of Germany

Division of Ser. No. 182,004, Aug. 27, 1980, abandoned. This application Sep. 18, 1980, Ser. No. 303,609

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945017; Jan. 4, 1980, 3000161

Int. Cl.³ C10B *23/00, 27/00*

U.S. Cl. 201—14 2 Claims



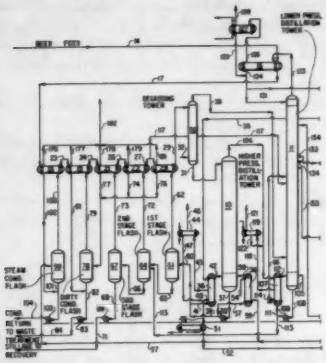
1. In a method of operating a coking chamber of rectangular horizontal outline, with major sides bounded by heated lateral walls and with minor sides closed by respective doors, to transform a charge of coal in said chamber into coke by heat transmitted thereto through said lateral walls, the improvement whereby hot gases evolving from the charge under the transmitted heat are channeled toward a flue through a vertical passage in each door separated from the interior of the chamber only by a thermally conductive metal partition in contact with the charge whereby the gases rising in said passage transfer part of their heat through said partition by excellent heat conduction to the end region of said charge in contact with said partition to ensure full coking of said charge along said end region thereof, the heat of the gases being prevented by a thermally insulating layer on an outer wall of said passage from escaping to the exterior.

4,422,903

## ANHYDROUS ETHANOL DISTILLATION METHOD AND APPARATUS

John R. Messick; William R. Ackley, and George D. Moon, Jr., all of Cincinnati, Ohio, assignors to Raphael Katzen Associates International Inc., Cincinnati, Ohio

Filed Feb. 17, 1981, Ser. No. 234,771
Int. Cl.[3] B01D *3/36*; C07C *31/08, 29/80*
U.S. Cl. 203—19 19 Claims



1. In a distillation method for recovering anhydrous ethanol from a dilute ethanol-containing feedstock wherein the feedstock is introduced into a stripping and rectification section, a concentrated ethanol stream is removed from said stripping and rectification section and is introduced into a dehydrating tower, an azeotropic agent is also introduced into said dehydrating tower, a substantially azeotropic overhead is removed from said dehydrating tower, an anhydrous ethanol product is removed from the bottom portion of said dehydrating tower, the substantially azeotropic overhead from said dehydrating tower is condensed and separated into an upper phase rich in azeotropic agent and a lower water-rich phase, the upper phase is returned to said dehydrating tower, and the lower water-rich phase is introduced into an azeotropic agent stripping tower wherein the azeotropic agent is recovered and returned to the system;

the improvement which comprises the steps of:

(a) providing in said stripping and rectification section a first stage distillation tower comprising an ethanol stripping tower and a second stage distillation tower comprising a stripper-rectifier tower;

(b) preheating said feedstock;

(c) splitting the preheated feedstock into two preheated feed streams of unequal size;

(d) further preheating the larger of said feed streams;

(e) introducing said larger feed stream into the top portion of said first stage distillation tower;

(f) introducing the smaller of said feed streams into said second stage distillation tower;

(g) maintaining a higher pressure in said first stage distillation tower than in said second stage distillation tower;

(h) maintaining a higher pressure in said dehydrating tower than in said first stage distillation tower;

(i) condensing steam to supply the heat required in said dehydrating tower;

(j) supplying the heat required in said first stage distillation tower by condensing said substantially azeotropic overhead from said dehydrating tower;

(k) removing overhead ethanol-containing vapors from said first stage distillation tower and condensing said vapors to supply the heat required in said second stage distillation tower;

(l) introducing the condensate from step (k) into said second stage distillation tower;

(m) condensing overhead vapors from said second stage distillation tower;

(n) obtaining said concentrated ethanol stream by removing the same from the upper portion of said second stage distillation tower;

(o) withdrawing bottoms streams from said first and second stage distillation towers;

(p) said preheating of said feedstock in step (b) being effected first by means of the heat obtained in condensing step (m) and then by means of the heat contained in a bottoms stream withdrawn from at least the first of said first and second stage distillation towers; and

(q) said further preheating of said larger feed stream in step (d) being effected by means of the heat contained in the bottoms stream withdrawn from said first stage distillation tower.

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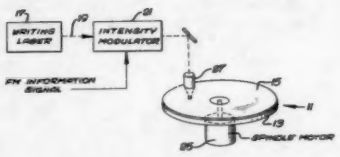
4,422,904

## METHOD FOR FORMING VIDEO DISCS

Richard L. Wilkinson, El Toro, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 329,800, Dec. 11, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 429,352
Int. Cl.[3] C25D *1/10*
U.S. Cl. 204—5 1 Claim




1. A method for forming a stamper for use in molding video disc replicas, comprising steps of:

forming a disc-shaped master recording that includes a glass substrate and a thin recording layer, an information signal being recorded in the recording layer in a sequence of spaced pits arranged in a plurality of substantially circular and concentric recording tracks;

vapor depositing a first thin, uniform, metallic film on the recording layer of the master recording, the vapor depositing occurring in a pressure of about $1\times10^{-6}$ torr or less;

electroplating a second thin, uniform, metallic film onto the first film, the first and second films together forming an integral, metallic layer;

separating the metallic layer from the underlying master recording; and

removing residual recording layer material from the undersurface of the separated metallic layer, to form a stamper suitable for use in molding video disc replicas.

4,422,905

## METHOD FOR PRODUCING SEPARATING NOZZLE ELEMENTS USED FOR SEPARATING GASEOUS OR VAPOROUS MIXTURES

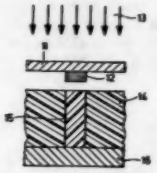
Erwin-Willy Becker; Wolfgang Ehrfeld; Gunther Krieg, all of Karlsruhe, and Wilhelm Bier, Eggenstein-Leopoldshafen, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe Gesellschaft mit beschränkter Haftung, Karlsruhe, Fed. Rep. of Germany

Filed Jun. 2, 1980, Ser. No. 155,652

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922642

Int. Cl.³ C25D 1/02, 1/20

U.S. Cl. 204—9 10 Claims



1. A method for producing a component of a separation element for separating a gaseous or vaporous mixture into fractions, which element is composed of a plurality of separating nozzle structures presenting passages defining mixture supply channels, separating chambers and fraction discharge channels, said method comprising:

forming a negative mold of the component by: providing a layer of a selectively electrically nonconductive material whose ability to be removed is influenced by application of selected radiation and mounting such layer on a substrate of an electrically conductive material; irradiating portions of the layer with such radiation in a pattern corresponding to the passages presented by the nozzle structure and to an extent such that material outside of the regions delimiting the passages is removable more easily than material within those regions; and removing the more easily removable material from the layer to create the negative mold of the component; and

forming the component by: filling the openings formed by said step of removing with a second material, which is a metal, by electrochemical deposition to create a solid plate-shaped member; removing the negative mold from the plate-shaped member; and removing the substrate after said step of filling.

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4,422,906

## PROCESS FOR DIRECT GOLD PLATING OF STAINLESS STEEL

Masami Kobayashi, 3-13-15, Hachimanyama, Setagaya-ku, Tokyo, Japan

Filed Sep. 17, 1981, Ser. No. 303,175

Int. Cl.³ C25D 5/36

U.S. Cl. 204—34 13 Claims

1. A process for direct gold plating of stainless steel which comprises the steps of:

dipping stainless steel in an activating solution which is an aqueous mixed acid solution containing, based on the weight of the solution,

(i) 3% to 20% by weight of hydrochloric acid,

(ii) 2 to 30% by weight of sulfuric acid,

(iii) 0.1 to 5% by weight of a nonionic or cationic surface active agent, and

(iv) 0.1 to 20% by weight of a compound selected from the group consisting of 2-pyrrolidone and N-alkyl-2-pyrrolidone, the alkyl moiety having 1 to 5 carbon atoms;

subjecting the activated stainless steel to cathodic electrolysis in a cathode electrolytic activation solution: and then electroplating the cathodically electrolyzed stainless steel with gold.

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4,422,907

## PRETREATMENT OF PLASTIC MATERIALS FOR METAL PLATING

Albert A. Birkmaier, Mendham; Gary A. Harpell, Morristown, both of N.J.; Bruce E. Kurtz, Marcellus, N.Y.; Gordhanbhai N. Patel, Camillus, N.Y.; Rustom P. Poncha, Syracuse, N.Y.; Adam L. Skovrinski, Memphis, N.Y., and James M. Lesco, Anaheim Hills, Calif., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 30, 1981, Ser. No. 335,773

Int. Cl.³ C25D 5/00; B05D 3/04

U.S. Cl. 204—38 B 23 Claims

20. An improved process for plating one or more metals onto the surfaces of a plastic material which comprises:

(a) exposing said material to an atmosphere containing an effective amount of ozone;

(b) contacting said exposed material with an effective amount of one or more strong organic or inorganic bases;

(c) coating said contacted material with a catalyst for electroless plating of metal thereon; and

(d) depositing a metal coating on said catalyzed material by electroless plating.

22. An improved process according to claim 20 which further comprises depositing one or more additional metal coatings onto said metal coated material of step d, by electroplating.

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4,422,908

## ZINC PLATING

Charles W. Welch, New Castle, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Nov. 23, 1981, Ser. No. 324,116

Int. Cl.³ C25D 3/22

U.S. Cl. 204—55 R 16 Claims

1. A process for producing zinc electrodeposits which comprises passing current from a zinc anode to a metal cathode wherein the current is passed through an acidic aqueous bath having a pH of from about 4.0 to about 5.5, containing from 20 to 35 grams per liter of zinc ions; from 55 to 155 grams per liter of sulfamate ions; from 15 to 30 grams per liter of boric acid; from 15 to 45 grams per liter of sodium chloride or potassium chloride; from 0.6 to 3.0 grams per liter of an organic salt which is an alkali metal salt of a carboxylic acid complexing agent; from 0.1 to 0.4 grams per liter of aromatic carbonyl compound, from 0.5 to 1.1 grams per liter of a sulfonated fixed oil, and from 1.0 to 15 grams per liter of a polyether surfactant.

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4,422,909

## ELECTROLYTIC PROCESS FOR THE MANUFACTURE OF ALKALI METAL HALATE

Everett M. Spore, Tonawanda, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

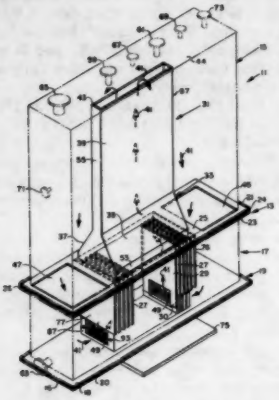
Division of Ser. No. 104.231, Dec. 17, 1979, Pat. No. 4,332,659. This application Dec. 27, 1981, Ser. No. 328,173

Int. Cl.³ C25B 1/24

U.S. Cl. 204—95 1 Claim

1. A method for manufacturing sodium chlorate in an electrolytic cell comprising a cell housing, electrode pairs and an electrolyte which includes an aqueous solution of sodium chloride, which method comprises applying to a plurality of electrode pairs in said cell a voltage of from 1.8 to 3 volts to cause a direct current flow at a current density in the range of 0.1 to 0.3 ampere/sq. cm. of anode surface, with the temperature of the electrolyte being maintained in the range of 10° to 95° C., flowing the electrolyte, including hypochlorite and hydrogen gas, through a common funneling chimney in the cell extending over the electrode pairs, said funneling chimney

having a lower funneling portion and an upper passageway portion, removing hydrogen gas from such electrolyte after passage thereof through the passageway, flowing the electrolyte downwardly within the cell housing to the bottom of the cell, during which movement at least some hypochlorite is converted to chlorate, and moving it upwardly through the passageway at a velocity in the range of 20 to 100 cm./second, caused by the lifting power of the hydrogen gas in the passage-



way, the velocity of electrolyte in the passageway being 0.2 to 0.8 times the velocity of electrolyte traveling past the electrodes, whereby the hydrogen gas produced and removed contains less than 3% of oxygen on a volumetric basis, and continuing the electrolysis and such operations of the apparatus so that the electrolyte, when ready for removal from the apparatus, contains 350 to 700 g./l. of sodium chlorate, 80 to 160 g./l. of sodium chloride and 1 to 6 g./l. of sodium hypochloride, and removing such electrolyte from the apparatus.

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**4,422,910**

## METHOD OF MANUFACTURING ACICULAR GOETHITE

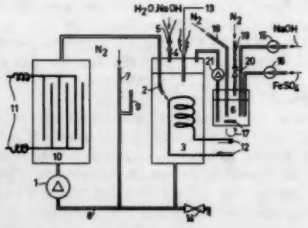
**Heinz Scholz, Kelmis-Hergenrath, Belgium; Wolfgang Schnitker, and Ernst Klein, both of Roetgen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Aug. 2, 1982, Ser. No. 403,953**

**Claims priority, application Fed. Rep. of Germany, Oct. 19, 1981, 3141421**

**Int. Cl.³ C25B *1/00***

**U.S. Cl. 204—96** **20 Claims**



**1. A method of manufacturing acicular goethite comprising the steps of:**

**providing a suspension of an iron(II)-containing compound in a liquid consisting essentially of water, said iron(II)-containing compound having a low water solubility;**

**oxidizing the suspension to form acicular goethite crystals; and**

**filtering off, washing, and drying the acicular goethite crystals;**

**characterized in that the step of oxidizing the suspension includes electrolytically oxidizing the suspension.**

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**4,422,911**

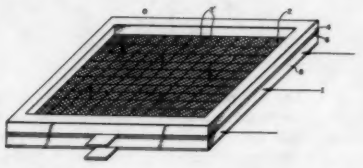
## METHOD OF RECOVERING HYDROGEN-REDUCED METALS, IONS AND THE LIKE AT POROUS CATALYTIC BARRIERS AND APPARATUS THEREFOR

**Walter Juda, Lexington; Robert J. Allen, Saugus; Robert Lindstrom, Gloucester, and Amiran Bar-Ilan, Newtonville, all of Mass., assignors to Prototech Company, Newton, Mass.**

**Filed Jun. 14, 1982, Ser. No. 387,963**

**Int. Cl.³ C25C *1/12, 7/00***

**U.S. Cl. 204—106** **17 Claims**



**1. A process for recovering hydrogen-reduced metals or ions from an aqueous electrolyte solution thereof, that comprises, providing a catalytic barrier having openings distributed therethrough to render said barrier pervious to said solution, applying hydrogen to said barrier and flowing the solution transversely through the barrier openings while contacting both surfaces of said barrier by the solution.**

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**4,422,912**

## METHOD AND APPARATUS FOR RECOVERING METALS FROM METAL RICH SOLUTIONS

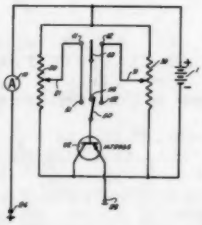
**William J. Stevens, 23/25 Woodstock St., Bondi Junction, New South Wales, Australia**

**Filed May 20, 1982, Ser. No. 380,444**

**Claims priority, application Australia, Jun. 12, 1981, PE9272**

**Int. Cl.³ C25C *1/20, 7/00***

**U.S. Cl. 204—109** **5 Claims**



**1. A method for recovering metal from a metal rich electrolyte solution comprising the steps of:**

**(a) flowing the solution from a vessel through a continuously acting electrolytic plating cell at a first feed rate when the solution level in the vessel is greater than a predetermined level and at a lesser feed rate when the solution level is below the predetermined level;**

**(b) adjusting the plating current of the cell from a first current when the cell is supplied at the first feed rate to a**

lower current when the cell is supplied at the lesser feed rate.

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4,422,913

## PROCESS FOR THE PRODUCTION OF 1,1,2-TRICHLORO-2,2-DIFLUOROETHANE

Eric R. Larsen, and Ernest L. Ecker, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 23, 1981, Ser. No. 324,184
Int. Cl.³ B01J 19/12; C07C 17/04
U.S. Cl. 204—158 HA 15 Claims

11. A process comprising contacting 1,1-difluoroethylene with chlorine in the presence of ultraviolet light at a temperature of from about −20° C. to about 100° C. in a liquid reaction medium comprising $CF_2ClCH_2Cl$ and $CF_2ClCHCl_2$ wherein the molar ratio of $CF_2ClCH_2Cl$ to $CF_2ClCHCl_2$ is at least about 1.5, thereby selectively producing 1,1,2-trichloro-2,2-difluoroethane.

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4,422,914

## POLYMER COMPOSITION HAVING TERMINAL ALKENE AND TERMINAL CARBOXYL GROUPS

Jung-Hsien Tsao, Marietta, and Paul R. Hein, Atlanta, both of Ga., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Jan. 16, 1981, Ser. No. 225,809
Int. Cl.³ C08G 18/00, 63/00, 69/00
U.S. Cl. 204—159.19 10 Claims

1. A polymer composition wherein the polymer consists essentially of a polymer having having a molecular weight of about 250 to 10,000 and acid content of about 0.1 to 4.0 mille-equivalents/gram comprising a terminal carboxyl group at one end and a single terminal alkene unsaturation at the other end, said carboxyl group and alkene unsaturation being in a ratio on said polymer of about 1 to 1.

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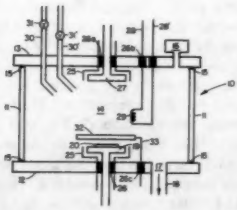
4,422,915

## PREPARATION OF COLORED POLYMERIC FILM-LIKE COATING

Roy F. Wielonski, Worthington, and Harry A. Beale, Columbus, both of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Sep. 4, 1979, Ser. No. 72,509
Int. Cl.³ B05D 3/06; C08F 00/00
U.S. Cl. 204—165 10 Claims



1. A method for coating a surface of a substrate with a colored polymeric film-like coating of selected visible color, which process comprises:

(a) introducing a plasma-polymerizable material into an apparatus having an evacuated interior environment with the introduced material passing through an electrical discharge region adjacent to said surface and of a frequency conducive to polymerize said material to a polymer and with said apparatus and said environment adapted to plasma polymerize said material;

(b) plasma polymerizing said plasma-polymerizable material to said polymer and depositing said polymer onto the surface of said substrate which serves as a cathode element or is contacting a cathode element within said apparatus while said cathode element is maintained at an electrical potential conducive for said depositing; and

(c) concurrently depositing discrete particulates which are opaque and of colloidal size and of a metal or metalloid along with the depositing of said polymer onto the surface of said substrate and with the depositing particulates of a size and dispersed distribution throughout the concurrently deposited polymer so as to alter the color of the polymer through selective scattering and adsorption of light by said deposited particulates to provide said selected visible color.

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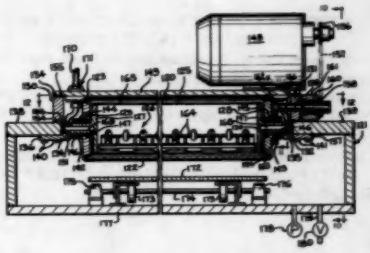
4,422,916

## MAGNETRON CATHODE SPUTTERING APPARATUS

Harold E. McKelvey, Plymouth, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 233,974, Feb. 12, 1981, Pat. No. 4,356,073. This application Feb. 11, 1982, Ser. No. 347,699
The portion of the term of this patent subsequent to Oct. 26, 1999, has been disclaimed.
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 R 12 Claims



12. The method of sputtering thin films of a selected coating material upon substantially planar substrates, comprising providing an elongated, cylindrical tubular member having a layer of the target material to be sputtered applied to the outer surface thereof, providing within said tubular member a magnetic field defining the length and width of the erosion zone on the target material, rotating said tubular member continuously about its longitudinal axis during the sputtering operation to bring different portions of the target material within the erosion zone for sputtering, and simultaneously moving the planar substrates past said erosion zone to receive the material being sputtered.

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4,422,917

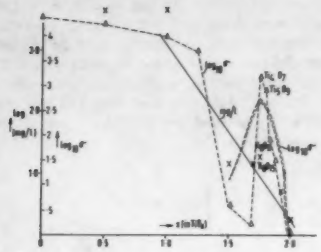
## ELECTRODE MATERIAL, ELECTRODE AND ELECTROCHEMICAL CELL

Peter C. S. Hayfield, Bickenhill, near Solihull, England, assignor to IMI Marston Limited, Wolverhampton, England

Filed Aug. 18, 1981, Ser. No. 293,961
Claims priority, application United Kingdom, Sep. 10, 1980, 8029076
Int. Cl.³ C23F 13/00; C25B 11/10, 9/00; H05B 3/60
U.S. Cl. 204—196 25 Claims

1. An electrochemical cell incorporating an electrode in which the electrode is formed from an electrode material of

solid coherent bulk titanium oxide having the general formula $TiO_x$ where x is a number in the region 1.67 to 1.9.



9. A cell as in claim 1 in which the electrode is formed of a range of titanium oxide compositions.

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**4,422,918**

## CURRENT-CONDUCTING ASSEMBLY FOR A TRAVELING WIRE-ELECTRODE

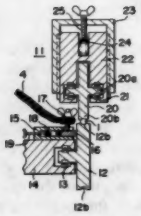
**Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan**

**Continuation-in-part of Ser. No. 115,390, Jan. 25, 1980, Pat. No. 4,263,116. This application Feb. 13, 1981, Ser. No. 234,578**

**Claims priority, application Japan, Feb. 14, 1980, 55-16512[U]**

**Int. Cl.³ C25D** *17/00;* **B23P** *1/04, 1/12;* **H01R** *39/28*

**U.S. Cl. 204—206** **17 Claims**



1. A current-conducting assembly for conducting a machining current to a wire electrode axially displaced by drive means and thereby continuously transported from a supply side to a collection side through the region of a workpiece in an electroerosion machine, the assembly comprising:

a pair of freely rotatable coplanar wheels having their respective shafts extending in parallel with each other, at least one of said wheels being grooved along its periphery for retaining said wire electrode in said groove;

reboundable pressure means coupled with one of said shafts for urging said shafts towards one another while substantially maintaining the parallelism thereof to press said wire electrode between said wheels to allow said wheels to rotate with said wire electrode traveling axially; and

brush means connectable electrically to a source of said machining current and adapted to be in electrical contact with a flank of at least one of said wheels which is electrically conductive for conducting the current to said wire electrode.

**4,422,919**

## ELECTROLYTIC CELL

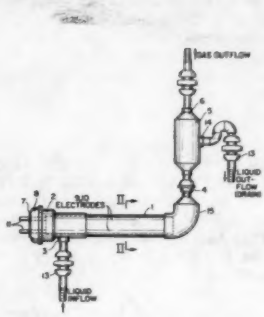
**Peter Fabian, Freigericht; Manfred Gündling, Alzenau, and Peter Rösler, Ronneburg, all of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany**

**Filed Sep. 22, 1982, Ser. No. 421,391**

**Claims priority, application Fed. Rep. of Germany, Sep. 26, 1981, 3138438**

**Int. Cl.³ C25B** *9/00;* **C25C** *7/00*

**U.S. Cl. 204—270** **19 Claims**



1. An electrolytic cell for use in the treatment of water in a flow-through piping system, comprising:

a horizontally extending tubular housing section (1) having an end opening at respective opposite ends thereof, and a liquid inflow means (3) communicating with the interior of said tubular housing section;

an end-cap (2) removably coupled to one end of said tubular housing section (1) for closing off the end opening at said one end of said tubular housing section (1), said end cap including a distributor plate (7);

an electrode stack, formed as a cartridge-like unit, mounted to said distributor plate (7) of said end-cap (2), said electrode stack comprising a plurality of anodes (9) and cathodes (10) alternately mounted substantially parallel and at a spacing from one another and adapted to be inserted in said tubular housing section (1); first and second power distributing parts (9a, 10a) respectively electrically coupled to said anodes and cathodes (9, 10), said power distributing parts (9a, 10a) being connected to said distributor plate (7), said cartridge-like electrode stack being tightly insertable into and fixed to said end opening at said one end of said tubular housing section (1) by means of said end cap being coupled to said one end of said tubular housing section (1); and

a connecting unit (15, 4, 5) coupled to the other end of said tubular housing section (1) and being external of said tubular housing section (1), said connecting unit comprising a liquid outflow means (14) and a gas outflow means (6) for exhausting gas from said tubular housing section (1);

said end cap (2) being structurally independent of said liquid inflow means (3) and said connecting unit (15, 4, 5) such that said end cap is removable with said electrode stack for servicing of said electrode stack without moving said liquid inflow means (3) and without moving said connecting unit (15, 4, 5) or said liquid outflow means (6).

4,422,920

## HYDROGEN CATHODE

John Z. O. Stachurski, Amherst, and Gerald F. Pokrzyk, Lewiston, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jul. 20, 1981, Ser. No. 284,879
Int. Cl.³ C25B 11/04
U.S. Cl. 204—290 R 7 Claims

1. A cathode for use in electrolytic processes comprising a substrate material and a surface layer applied to at least a part of the substrate comprising a codeposit of a first metal selected from the group consisting of iron, cobalt, nickel and mixtures thereof, and a second metal selected from the group consisting of molybdenum, manganese, titanium, tungsten, indium, chromium, and combinations thereof, said surface layer being applied from an electroplating solution containing said metals, an alkaline metal thiocyanate or thiourea and a minor amount of zinc ions.

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4,422,921

## BIPOLAR ELECTRODES WITH GRAPHITE AS THE CARRIER AND THEIR PRODUCTION

Hans Roos, Bad Durkheim; Hugo Boehn, Ludwigshafen; Knut Bittler, Speyer, and Dieter Schlaefer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 16, 1982, Ser. No. 408,600
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3132753
Int. Cl.³ C25B 11/00
U.S. Cl. 204—290 R 2 Claims

1. A bipolar electrode with graphite as the carrier, which has a chromium trioxide layer not less than 10 μm thick on both the anode face and the cathode face.

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4,422,922

## COAL LIQUEFACTION AND HYDROPROCESSING OF PETROLEUM OILS

Joel W. Rosenthal, El Cerrito, and Arthur J. Dahlberg, Rodeo, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 241,805, Mar. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 194,730, Oct. 6, 1980, Pat. No. 4,330,393, which is a continuation-in-part of Ser. No. 12,185, Feb. 14, 1979, Pat. No. 4,330,390, which is a continuation-in-part of Ser. No. 754,198, Dec. 27, 1976, Pat. No. 4,330,389. This application Jul. 26, 1982, Ser. No. 401,455
Int. Cl.³ C10G 1/00, 1/06
U.S. Cl. 208—8 LE 10 Claims

1. A process for obtaining enhanced demetallation of a petroleum oil containing soluble metal compounds during the hydroprocessing of the oil in a hydroprocessing zone and substantially eliminating the accumulation of coke in said zone comprising:

(a) forming a mixture consisting essentially of petroleum oil containing soluble metal compounds and particulate coal to form a feed slurry so as to provide a concentration of coal ash in the hydroprocessing zone of from about 0.2 to 6% by weight; and

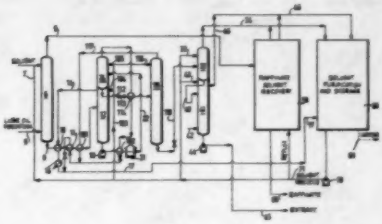
(b) contacting the feed slurry with added hydrogen in the hydroprocessing zone in the absence of externally supplied catalyst under hydroprocessing conditions under which coke would tend to accumulate in the absence of the coal to dissolve at least 50% of the coal on a moisture- and ash-free basis to produce an effluent comprising a normally liquid portion having an enhanced reduction in soluble metals concentration and an undissolved solids portion containing metals from the petroleum oil whereby accumulation of coke in the hydroprocessing zone is substantially eliminated.

4,422,923

## PROCESS FOR RECOVERING SOLVENTS FROM SOLVENT-CONTAINING HYDROCARBON PHASES IN HYDROCARBON RAFFINATION SYSTEMS

Gerhard Wirtz, Frankfurt, and Rainer Maxelon, Raunheim, both of Fed. Rep. of Germany, assignors to Edeleanu Gesellschaft mbH, Frankfurt, Fed. Rep. of Germany

Filed Jan. 19, 1981, Ser. No. 226,415
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1980, 3002984
Int. Cl.³ C10G 21/28
U.S. Cl. 208—33 5 Claims



1. In a process for treating a mineral oil stock with a selective solvent to separate components of different chemical nature, wherein solvent is recovered from the solvent-rich product phase by subjecting said product phase to sequential flash evaporation in a low pressure first evaporation stage followed by heating the unvaporized portion of the product phase from said first stage and flash vaporization in a high pressure second evaporation stage and finally by vacuum flash evaporation and stripping of residual solvent from said product phase at subatmospheric pressure, the improvement which comprises subjecting the unvaporized portion of the product phase from said second evaporation stage to flash evaporation in an additional intermediate pressure evaporation stage following the high-pressure stage at an operating pressure between the pressure of the low pressure stage and the pressure of the high-pressure stage, heat from an external source is supplied to said high pressure evaporation stage, and all of the heat for evaporation in said intermediate pressure evaporation stage is supplied as heat of condensation from condensing vapors of said high pressure evaporation stage.

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4,422,924

## SOLVENT DEWAXING WAXY HYDROCARBONS USING AN ALPHA OLEFIN POLYMER-OLEFIN VINYL ACETATE COPOLYMER COMPOSITE DEWAXING AID

Takashi Onodera, Urawa; Kikuji Komine, Tokorozawa; Fumio Ohashi, and Tsutomu Naito, both of Ono, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 305,919, Sep. 28, 1981, which is a continuation-in-part of Ser. No. 233,380, Feb. 11, 1981, abandoned, which is a continuation-in-part of Ser. No. 184,921, Sep. 8, 1980, abandoned, which is a continuation of Ser. No. 102,652, Dec. 12, 1979, abandoned, which is a continuation of Ser. No. 36,044, May 4, 1979, abandoned, which is a division of Ser. No. 926,811, Jul. 21, 1978, Pat. No. 4,192,733. This application Aug. 23, 1982, Ser. No. 410,879
Int. Cl.³ C10G 73/04, 73/06
U.S. Cl. 208—33 14 Claims

1. In a solvent dewaxing process wherein a waxy hydrocarbon oil is mixed with a dewaxing aid and dewaxing solvent and chilled to form a slurry comprising solid particles of wax and a mixture of dewaxed oil and solvent, the improvement which comprises using as a dewaxing aid a mixture of (A) an alpha-olefin homopolymer prepared from at least one alpha-olefin having from 10 to 25 carbon atoms or a copolymer made up of a monomer mixture comprising more than 50 wt. % of at least

2 $C_{10}$ to $C_{25}$ alpha-olefin monomers, said alpha-olefin polymer having an average molecular weight of from between about 10,000 to 1,000,000, and having a melt index greater than 1.8 g/10 minutes and (B) an olefin-vinyl acetate copolymer having a vinyl acetate molecular weight of from about 50,000 to 1,000,000, and a melt index greater than 2 g/10 minutes and wherein components (A) and (B) are used in a weight ratio to each other ranging from about 95/5 to 5/95 of (A)/(B).

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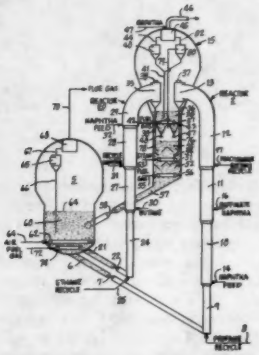
## 4,422,925
## CATALYTIC CRACKING

**Dale Williams, and John C. Strickland, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.**

**Filed Dec. 28, 1981, Ser. No. 335,303**
**Int. Cl.³ C10G *11/05***
**U.S. Cl. 208—75** **11 Claims**



1. A process for the production of normally gaseous olefins from a hydrocarbon feedstock in a transport type fluid catalytic cracking reaction zone in the presence of a zeolite catalyst in which fresh feedstock is brought into contact with hot regenerated catalyst in a riser reaction zone, which comprises charging heavy hydrocarbon charge stock to an upper section of a riser reaction zone near its discharge end, charging a normally gaseous $C_2$ to $C_3$ rich paraffinic charge stock into the lowermost portion of said riser reaction zone into contact with hot freshly regenerated catalyst and introducing a paraffinic normally liquid naphtha or gas oil into a section of said riser reaction zone intermediate said lower and upper sections of said riser reaction zone.

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## 4,422,926
## SEPARATING BASIC ASPHALTENES USING BRONSTED ACID TRANSITION METAL OXIDE ACID CATALYSTS

**Kenneth A. Gould, Berkeley Heights; Dane C. Grenoble, Plainfield; Lawrence L. Murrell, South Plainfield, and Wim J. M. Pieters, Morristown, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.**

**Filed Sep. 24, 1981, Ser. No. 305,265**
**Int. Cl.³ C10G *11/04, 25/00, 25/12***
**U.S. Cl. 208—86** **19 Claims**

1. A process for selectively removing basic asphaltenes from a basic asphaltene-containing hydrocarbon feed which comprises contacting said feed, in an adsorption zone, with a fresh or regenerated solid acid catalyst having primarily Bronsted acidity, said catalyst comprising at least one catalytic metal oxide selected from the group consisting of the oxides of (a) tungsten, niobium and mixtures thereof and (b) mixtures of (a) with tantalum, hafnium, chromium, titanium, zirconium and mixtures thereof supported on an pyrogenic alumina support, for a time sufficient to adsorb at least a portion of said basic asphaltenes from said feed to produce a feed of reduced basic asphaltene content.

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## 4,422,927
## PROCESS FOR REMOVING POLYMER-FORMING IMPURITIES FROM NAPHTHA FRACTION

**Dennis C. Kowalczyk, Pittsburgh; Bruce A. Bricklemyer, Avonmore, and Joseph J. Svoboda, Pittsburgh, all of Pa., assignors to The Pittsburg & Midway Coal Mining Co., Englewood, Colo.**

**Filed Jan. 25, 1982, Ser. No. 341,234**
**Int. Cl.³ C10G *45/00***
**U.S. Cl. 208—211** **17 Claims**

1. A process for preventing polymer formation from polymer precursor material in a naphtha fraction which comprises passing said naphtha fraction containing polymer precursor materials to a vaporization zone,

introducing a wash oil stream into said vaporization zone concurrently with said naphtha fraction,

passing a stream comprising heated hydrogen through said vaporization zone in a direction countercurrent to that of said naphtha-wash oil admixture,

recovering a vaporized naphtha fraction from said vaporization zone which can be subjected to hydrotreating without substantial formation of polymer deposits,

passing a feed consisting essentially of said vaporized naphtha fraction and hydrogen to a catalytic hydrotreating zone under hydrotreating conditions to produce a naphtha feed stock of sufficient purity to use as a reformer charge stock.

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## 4,422,928
## SILICA FLOTATION COLLECTORS DERIVED FROM ISONONYL ALCOHOL

**Quentin T. McGlothlin, Spring, and Barry M. O'Brien, Houston, both of Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.**

**Continuation of Ser. No. 141,707, Mar. 9, 1981, abandoned. This application Sep. 17, 1982, Ser. No. 419,308**
**Int. Cl.³ B03D *1/14***
**U.S. Cl. 209—166** **7 Claims**

1. A froth flotation process for separating silica from iron ore, which comprises frothing said ore in an aqueous medium in the presence of 0.1 to 2 pounds per ton of said ore of a water dispersible, liquid aliphatic ether amine having the general formula:

$$R—O—(R^1—O)_z—CH_2—CH_2—CH_2—NH_2$$

where R— is an aliphatic methyl branched radical having 9 carbon atoms, $R^1$ is ethyl or propyl and z is an integer of from 0 to 10.

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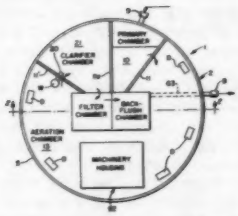
## 4,422,929
## WASTEWATER TREATMENT PLANT

**Dewey E. Owens, P.O. Box 2443, Lafayette, La. 70502**

**Filed Sep. 2, 1981, Ser. No. 298,810**
**Int. Cl.³ B01D *23/24***
**U.S. Cl. 210—108** **6 Claims**

1. A wastewater treatment plant including, a plurality of separate adjacent chambers, one said chamber comprising an aeration chamber adapted to receive wastewater, other ones of said chambers comprising clarifier, filter and backwash chambers, said filter and backwash chambers each comprising air-tight sealed chambers, fluid flow conveying means connecting adjacent ones of said chambers to provide communication of fluid serially from said aeration chamber to said clarifier chamber to said filter chamber to said backwash chamber and then to discharge clean fluid from said backwash chamber, means in said aeration chamber biologically attacking and breaking down organic matter in said wastewater therein, means in said clarifier chamber collecting heavier solid waste matter from

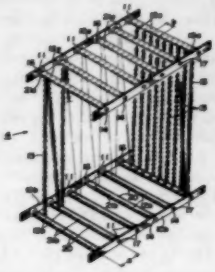
adjacent the lower reaches thereof and returning said matter to said aeration chamber, means in said clarifier chamber collecting lighter floating solid waste particles from adjacent the surface of said wastewater therein and returning said particles to said aeration chamber, said collecting means including a floating skimmer, a filter bed in said filter chamber disposed intermediate said fluid conveying means therein communicating wastewater from said clarifier chamber to said filter chamber and that said conveying means discharging fluid from said filter chamber to said backwash chamber, said fluid flow conveying means from said clarifier chamber to said filter chamber including a weir within said clarifier chamber, said filter chamber including an upper and bottom compartment, said filter bed disposed intermediate said two compartments, said fluid flow conveying means from said filter chamber to said backwash chamber disposed within said upper compartment, said fluid flow conveying means between said clarifier chamber and filter chamber including a coupling communicating with said filter chamber bottom compartment to normally direct incoming fluid upwardly through said filter bed to said upper compartment, means in said backwash chamber operable to exert a forced backflush of clean fluid from said backwash chamber and serially into said filter chamber upper compartment thence, downwardly through said filter bed and thence through said coupling, said fluid flow conveying means discharging clean fluid from said backwash chamber including a discharge coupling, said operable means to exert a forced backflush including an air pressure line in said sealed backwash chamber, a normally opened check valve between said air pressure line and said discharge coupling operable by air from said air pressure line to close said check valve to seal said discharge coupling, said air pressure line including an end portion having an internal bore, a valve head having a plug slidably fitted within said bore, said air pressure line provided with air holes whereby, air pressure upon said plug displaces said plug to expose said air holes and admit air into an backwash chamber concurrently with said closing of said check valve and forced backflush, agitator means disposed within said filter bed, a pipe joined to said agitator means and adapted to supply fluid from an external source to said agitator means to loosen said filter bed, a by-pass line in said clarifier chamber receiving said backflush fluid from said filter chamber and directing it into said aeration chamber without disturbing wastewater within said clarifier chamber, said fluid flow conveying means between said clarifier chamber and said filter chamber including a substantially vertical discharge line having a lowermost portion joined to said clarifier chamber coupling, a normally opened check valve in said discharge line and adjacent said weir, and said by-pass line communicating with said discharge line intermediate said check valve and clarifier chamber coupling.




## 4,422,930
## APPARATUS FOR TREATING WASTE WATER

Misao Hatanaka, Toda, Japan, assignor to Kajima Kensetsu Kabushiki Kaisha and Nippon Sangyo Kikai Kabushiki Kaisha, both of Tokyo, Japan

Filed Jan. 29, 1982, Ser. No. 343,894
Claims priority, application Japan, Nov. 19, 1981, 56-172254[U]
Int. Cl.³ C02F 3/04
U.S. Cl. 210—150 3 Claims



1. Apparatus for promoting biological oxidation of sludge in a waste water treatment tank, comprising:

A. means defining a substantially rigid frame having

(1) a pair of horizontally extending upper rails that are laterally spaced apart and opposite one another and

(2) a pair of laterally opposite horizontally extending lower rails, each spaced below one of said upper rails;

B. a first plurality of rods, each bridging across said pair of upper rails and resting upon the upper rails to be shiftable along them;

C. a second plurality of rods, each bridgingly engageable with said lower rails at the undersides of the latter to be shiftable along said lower rails;

D. a plurality of ribbon-like contact members,

(1) each having numerous laterally projecting strands along its length,

(2) each trained in zigzag, with substantially vertically extending stretches, alternately over successive rods of said first plurality and under successive rods of said second plurality, to be supported by the rods of said first plurality and to support the rods of said second plurality in engagement with said lower rails, and

(3) the several contact members being engaged with each rod in spaced relation to one another along the length of the rod; and

E. a pair of supple, belt-like gap-retaining members for each of said pluralities of rods, each of said gap-retaining members having a connection with one end of each of the rods of its plurality, said connections being spaced apart at predetermined distances along the gap-retaining member so that each pair of gap-retaining members, when maintained under lengthwise tension, establishes the distances between adjacent rods of its plurality.

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## 4,422,931
## OIL CONCENTRATOR

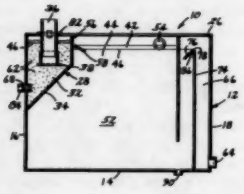
Girma Wolde-Michael, 100 Canabury Ct., Little Canada, Minn. 55117

Filed Apr. 15, 1982, Ser. No. 368,648
Int. Cl.³ B01D 21/10; B01F 3/04; C02F 1/24
U.S. Cl. 210—168 12 Claims

1. An oil concentrator for separating a fluid comprising: a fluid tight tank having a first chamber with a sloping bottom; a second chamber opposite said first chamber; a third chamber between said first and second chambers; means for allowing

mixed fluid containing heavy and light fluids to ingress said first chamber; means for allowing egress of said fluids from said first chamber and ingress into said third chamber; first baffle means located within said third chamber for directing the flow of fluid between said third chamber and said second chamber; second baffle means separating said third and said second chambers; said second baffle means including means for agglomerating material within said fluid located near an upper edge of said second baffle means; a light fluid outlet located within said second chamber; a heavy fluid outlet located within said third chamber, and; means for aerating the contents of said first chamber, located within said first chamber.

12. A waste oil concentrator for receiving and separating a mixture of oil and machine coolant comprising: a fluid tight tank having a bottom, a first end wall joined to said bottom and ascending vertically therefrom to an upper limit defining an upper edge, said upper edge encircling said tank a uniform distance from said bottom, a front side wall joined to said bottom and said first end wall and ascending vertically to said upper edge, a second end wall joined to said front side wall and said bottom and ascending vertically to said upper edge, a back side wall joined to said first and second end walls and to said bottom, and ascending vertically to said upper edge; a first chamber defined by an angled baffle plate affixed in fluid tight contact to said front and back side walls near said first end wall and having an upper portion positioned parallel to said first end wall, said upper portion of said baffle plate depending vertically from said upper edge for a predetermined distance, said angled baffle plate having a lower portion extending in a plane approximately forty five degrees below a horizontal plane and making a fluid tight contact with said upper portion and said first end wall; ingress means for introducing fluid containing oil and coolant into said first chamber said ingress means including a mounting plate extending between said front and back side walls near said first end wall; said angled baffle plate having means for egressing said fluid and means for quietening said egressing flow positioned adjacent said means for egressing; a first vertical baffle, extending between said front and back side walls and depending parallel to said second end wall, from said upper edge a distance less than the distance between said upper edge and said bottom near said second end wall; a second vertical baffle extending between said front and back side walls and ascending parallel to said second end wall from said bottom a distance less than the distance between said upper edge and said bottom, said second vertical baffle located between said first vertical baffle and said second end wall and having an upper edge; an agglomeration baffle affixed to said upper edge of said second vertical baffle and extending in a direction generally toward said first vertical baffle, said agglomeration baffle extending from said front wall to said back wall; means for allowing light fluid to egress said tank positioned in one of said side walls, between said first vertical baffle and said angled baffle plate, and; means for allowing heavy fluid to egress said tank positioned in said second end wall near said bottom.

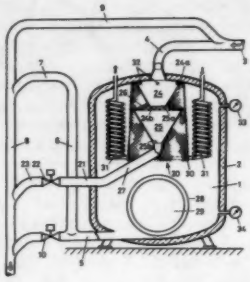


**4,422,932**

## DEVICE FOR THE REMOVAL OF HEAT FROM WASTE WATER

Felix Kalberer, Bakuweg 34, CH-7320 Sargans, Switzerland

Filed Feb. 10, 1982, Ser. No. 347,609
Claims priority, application Switzerland, Feb. 16, 1981, 991/81
Int. Cl.³ B01D 25/00; F28F 19/00
U.S. Cl. 210—186 6 Claims



1. Device for removing heat from waste water by means of heat exchangers (31) arranged in a container (1) traversed by said waste water, comprising an inlet conduit (4) at the top of said container (1) connected by a connecting means (20) with a first outlet conduit (21) disposed in the lower portion of said container (1) and having a check valve (22), said connecting means (20) comprising two superposed hollow bodies (24, 25) in a stepwise arrangement with one another and a coarse screen (26) arranged therebetween for closing an overflow opening, a second outlet conduit (5) discharging at the floor of said container (1) and connected through a riser (6) and a bend (7) with a sewerage conduit (8) into which said first outlet conduit (21) is also directed, and a fine screen (30) surrounding said connecting means (20) at least in the region of said coarse screen (26) being disposed in said container (1) between said connecting means (20) and said heat exchangers (31).

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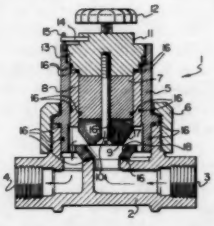
**4,422,933**

## MAGNETIC WATER CONDITIONING DEVICE

Severin F. Sverre, 3187 Thompson Pl., West Vancouver, B.C., Canada, V7V 3E3, John O. Richmond, 4750 Narvaez Dr., Vancouver, B.C. Canada, V6L 2J2

Filed Oct. 26, 1981, Ser. No. 314,729
Claims priority, application Canada, Jun. 19, 1981, 380251
Int. Cl.³ B01D 35/06
U.S. Cl. 210—222 10 Claims



1. A magnetic water conditioning device comprising:
(a) a hollow housing suitable for the passage therethrough of water;
(b) a hollow cup affixed to housing (a);
(c) a permanent magnet enclosed around its circumference within a water-protective sleeve, and at its ends respec-

tively by an adjusting cap and a magnet extension, said components fitting as an assembled group within the interior of internal cup (b); and

(d) internal cup (b) having therein one or more ports through which water may pass, and embodying therein externally adjustable interface surfaces which can be adjusted in distance from one another to thereby regulate the rate of flow of water through the interface area.

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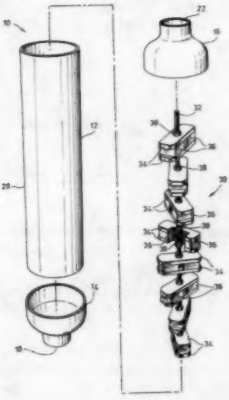
**4,422,934**

## MAGNETIC DEVICE FOR THE TREATMENT OF CALCAREOUS FLUIDS

**Howard A. Debney, Mississauga, and Darrell C. Spencer, Riverview, both of Canada, assignors to Debney-Spencer Industries Ltd., Mississauga, Canada**

**Filed Jun. 2, 1982, Ser. No. 384,208**
**Claims priority, application Canada, Apr. 22, 1982, 401443**
**Int. Cl.³ B01D 35/06**
**U.S. Cl. 210—222** **13 Claims**



1. A device for magnetically treating water to prevent the formation of scale, the device comprising:

an elongate housing having an inlet and an outlet for the flow of water therethrough, said housing being dimensioned so as not to restrict liquid flow through the device and to prevent the formation of settlement reservoirs inside the housing;

a support member located in the housing;

a plurality of transverse holding elements in the form of metal plate members connected to the support member and arranged longitudinally spaced-apart inside the housing, said holding elements being arranged in pairs with each pair being arranged in parallel;

a plurality of magnets located inside the housing for directly contacting the water in the housing, the magnets being angularly disposed in a helical arrangement and oriented with their poles all facing the same direction, each magnet being located between and retained in position by a respective pair of holding elements; and

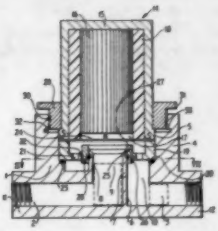
clamping means connected between the support member and the holding elements for clamping the magnets between the holding elements.

**4,422,935**

## APPARATUS FOR MAGNETIC TREATMENT OF WATER OR OTHER LIQUIDS

**Denis A. E. Mattingly, Enfield, England, assignor to Bernard Strutt Agencies Limited, Kingston-Upon-Thames, England**

**PCT No. PCT/GB79/00218, § 371 Date Jul. 21, 1981, § 102(e) Date Jul. 21, 1981, PCT Pub. No. WO81/01840, PCT Pub. Date Jul. 9, 1981**
**PCT Filed Dec. 21, 1979, Ser. No. 285,123**
**Int. Cl.³ C02F 1/48**
**U.S. Cl. 210—223** **5 Claims**



1. An apparatus for magnetically conditioning a stream of water, which comprises:

a flow-through housing defining a fluid flow-path, the housing having an inlet and outlet connected by said flow path,

a first magnetic pole provided by a pole piece disposed in said housing, made of a magnetic material resistant to sensitive contact with said water, said pole piece being of hollow cylindrical form and said flow path having a first portion defined within the cylinder of said pole piece and a second portion in a region outside thereof,

a second magnetic pole provided by a surface made of a material sensitive to contact with said water and disposed in spaced apart juxtaposed relation with respect to said first pole, an annular magnetic gap being defined within the housing by said spacing apart, with said first and second portions of said flow path communicating through said gap, and

a magnetically-permeable separator disposed in said gap over the water-contacting surfaces of the second pole, said separator protecting said surfaces from contact with said water and permitting magnetic flux to pass through said separator and into said magnetic gap.

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**4,422,936**

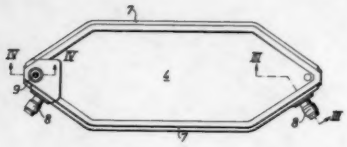
## DEVICE FOR THE DIFFUSION OF SUBSTANCES BETWEEN TWO FLUIDS VIA SEMIPERMEABLE MEMBRANES

**Gerhard Riede, Vellinge, and Nils-Joel E. Nilsson, Sisdala, both of Sweden, assignors to Gambro AG, Switzerland**

**PCT No. PCT/SE80/00083, § 371 Date Mar. 17, 1981, § 102(e) Date Mar. 17, 1981, PCT Pub. No. WO81/02682, PCT Pub. Date Oct. 1, 1981**
**PCT Filed Mar. 19, 1980, Ser. No. 245,648**
**Int. Cl.³ B01D 31/00**
**U.S. Cl. 210—321.4** **9 Claims**

1. A device for the diffusion of substances between first and second fluids through semi-permeable membranes, comprising a stack of alternating spacer plates and semi-permeable membranes, each of said spacer plates and semi-permeable membranes being substantially flat and including an elongated middle portion and tapered end portions extending away from said middle portion, said stack thus having tapered end portions and being of a substantially uniform height throughout, said stack having opposite substantially parallel top and bottom faces, first and second end plates each having an inner surface and an outer surface, said inner surfaces facing said top and bottom faces of said stack, clamping means for clamping said

first and second end plates together with said stack therebetween, inlet and outlet passages for said first fluid, inlet and outlet passages for said second fluid, first fluid inlet means for feeding said first fluid to said inlet passage for said first fluid, first fluid outlet means for withdrawing said first fluid from said outlet passage for said first fluid, second fluid inlet means for feeding said second fluid to said inlet passage for said second fluid, second fluid outlet means for withdrawing said second fluid from said outlet passage for said second fluid, distribution means for conducting said first and second fluids on opposite sides of said semi-permeable membranes as said first and second fluids pass from their respective inlet passages to their respective outlet passages, first fluid duct means forming a part of one of said first fluid inlet and outlet means and being disposed within one of said tapered end portions between



the outer surfaces of said first and second end plates, said one of said first fluid inlet and outlet means also including first fluid nipple means sealingly connected to said first fluid duct means, and wherein said first fluid nipple means extends exteriorly of and away from said one of said tapered end portions and is entirely contained within a volume bounded by a portion of a rectangular perimeter defined by the maximum width of said stack and the maximum length of said stack, by the outer surface of the tapered surface from which said first fluid nipple means extends, and by said outer surfaces of said first and second end plates such that said first fluid nipple means is disposed within a volume defined by outer surfaces of said device which cooperate to provide an enclosure which provides protection against inadvertent damage to said first fluid nipple means.

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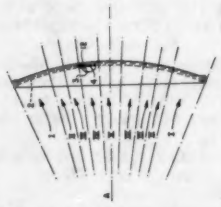
**4,422,937**

## STATIC SCREEN

**James D. Connolly, P.O. Box 1238, Princeton, W. Va. 24740**

**Filed Mar. 14, 1980, Ser. No. 130,461**
**Int. Cl.³ B01D** *39/10*
**U.S. Cl. 210—409** **8 Claims**



1. In screening apparatus for separating by size particles of a slurry fed thereto, the improvement comprising a reversible static screen in operative position removably mounted at a predetermined slope in the apparatus, said screen having longitudinally spaced ends and transversely spaced sides and presenting to the slurry for flow longitudinally therealong a longitudinally arcuately concave sloping flow surface formed by laterally spaced parallel screen rods extending transversely of said screen normal to the flow direction of the slurry, said screen being bisected longitudinally by a transverse centerline thereof into counterpart halves each having in an end portion openings between screen rods of reduced width longitudinally of said screen relative to openings between screen rods in a center part of said screen longitudinally intermediate said end portions, the actual openings between the screen rods reducing progressively in width from the transverse centerline toward each end of the screen, and the effective width of the openings determinative of the maximum size of particles passable therethrough being substantially uniform from the centerline to whichever end is then the trailing end of the screen.

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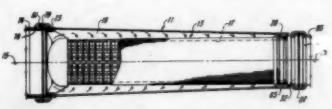
**4,422,938**

## BACKWASHING-TYPE FILTERING APPARATUS

**Wendell R. Miller, Denver, Colo., assignor to Quantum Systems Corporation, Denver, Colo.**

**Filed Jan. 25, 1982, Ser. No. 342,484**
**Int. Cl.³ B01D** *25/02, 27/12*
**U.S. Cl. 210—411** **10 Claims**



1. In a filtering apparatus for removing solid particles and the like from a liquid adapted to be cleaned by backwashing, the combination comprising:

an outer housing and an inner filter disposed within the outer housing defining therebetween an annular outer flow passage,

said filter having an inner flow passage and having an outer face and an inner face with liquid flow openings extending between said outer and inner faces through which the liquid flows to pass between said inner and outer flow passages whereby a forward flow liquid with solid particles is passed through an inlet into said outer flow passage, the solid particles being deposited on said filter and the liquid passing through the filter openings into and along said inner flow passage and out an outlet in said inner flow passage in the forward flow direction, and whereby a backwash liquid is passed into and along said inner flow passage, through said filter openings, and into said outer flow passage to remove solid particles collected on said filter in a backflow direction,

said outer housing having an internal dimension related to the external dimension of said inner filter so that said outer flow passage changes in dimension along the filter surface that has said liquid flow openings in such a way as to provide substantially a uniform liquid velocity through said filter at all points along said filter in both said forward flow direction and said backflow direction,

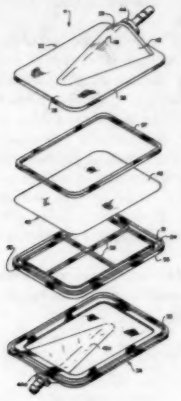
said outer housing being tapered along its length to converge in a direction away from said inlet toward said outlet in the forward liquid flow direction and wherein said inner filter has a substantially uniform external dimension substantially throughout its lengthwise extent.

4,422,939

## BLOOD AND PERFUSATE FILTER

Russell G. Sharp, Sugar Land; William R. Wilkinson, Missouri City; Charles C. Reed, and Denton A. Cooley, both of Houston, all of Tex., assignors to Texas Medical Products, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 92,013, Nov. 7, 1979, abandoned. This application Apr. 8, 1982, Ser. No. 366,747
Int. Cl.³ B01D *25/04*
U.S. Cl. 210—445 26 Claims



1. A filter for biological fluids comprising:

a first housing member having a generally planar upper surface, said first housing member having a secondary distribution reservoir formed in the upper surface thereof;

an inlet port located in the secondary distribution reservoir of the first housing member;

a second housing member having a generally planar lower surface, said second housing member having a secondary collection reservoir formed in the lower surface thereof;

an outlet port located in the secondary collection reservoir of the second housing member;

a rigid band bonded between said first and second housing members, said band spacing the housing members apart; and

a permeable filter element mounted in said band, said filter element forming a primary distribution reservoir with respect to the upper surface of the first housing member and forming a primary collection reservoir with respect to the lower surface of the second housing member, said band forming the sides of both said primary distribution reservoir and said primary collection reservoir.

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4,422,940

## METHOD OF NEUTRALIZING AND DETOXIFYING WASTES CONTAINING ORGANIC COMPOUNDS

James L. Cousino; James A. Nalewick, both of Montague, and Blair H. Hills, Whitehall, all of Mich., assignors to Bofors Nobel, Incorporated, Muskegon, Mich.

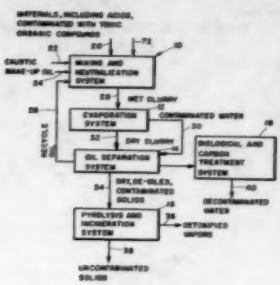
Filed May 17, 1982, Ser. No. 378,763
Int. Cl.³ B01D *1/26;* C02F *3/02, 11/10*
U.S. Cl. 210—631 36 Claims

1. A method for treating waste material containing both an acid and a toxic organic compound comprising the steps of:

combining said waste material with sufficient oil and sufficient caustic to form a pumpable slurry having a pH of 7 or higher, said pumpable slurry containing water, a salt, and said toxic organic compound;

separating said oil from said pumpable slurry to form a deoiled material containing said salt and said toxic organic compound;

pyrolyzing said deoiled material at a temperature below the melting point of said salt but sufficiently high to vaporize said toxic organic compound; and



incinerating the resultant vapor to detoxify said vaporized organic compound.

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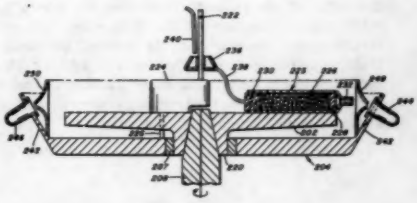
4,422,941

## APPARATUS FOR LIQUID-SOLID COLUMN CENTRIFUGATION CHROMATOGRAPHY AND METHOD

Maurice H. Vaughan, Jr., Pittsburgh, Pa., and Klaus B. Andersen, Copenhagen, Denmark, assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Sep. 8, 1980, Ser. No. 185,335
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—657 22 Claims



1. Column centrifugation chromatography apparatus comprising

column rotor means for supporting and applying centrifugal force to a plurality of circumferentially spaced nonhelical centrifugation columns,

said centrifugation columns being generally radially oriented,

collector rotor means for collecting material discharged from said columns,

a plurality of receptacles secured to said collector rotor means for receiving liquid discharged from said column,

said receptacles disposed radially outwardly of said columns,

power means for establishing synchronized relative movement of said column rotor means and said collector rotor means,

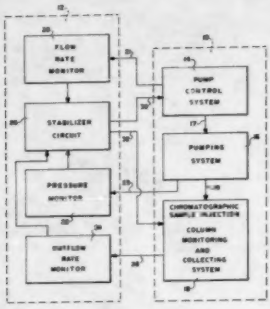
said column rotor means and said collector rotor means being mounted for substantially coaxial rotation, and

distribution means for supplying liquid to said columns while said column rotor means is subjected to said movement.

## 4,422,942
## METHOD FOR LIQUID CHROMATOGRAPHY

Robert W. Allington, Lincoln, Nebr., assignor to Isco, Inc., Lincoln, Nebr.

Filed Sep. 9, 1981, Ser. No. 300,567
Int. Cl.³ B01D 15/08
U.S. Cl. 210—659 41 Claims




1. A method of rapidly bringing a chromatographic column to equilibrium pressure comprising the steps of:

setting a pumping speed for pumping fluid from a pumping system into said column for a predetermined rate of flow;

measuring, at a time of a low value of pressure, a characteristic of fluid being transferred from the pumping system to the chromatographic column related to the pressure of the fluid;

estimating the equilibrium value of pressure from said measurements of said characteristic mode at said low value characteristic;

increasing the pumping rate of flow until said estimated equilibrium value of pressure is reached; and

the step of estimating including the steps of taking the time derivative of the pressure; measuring the pressure at a predetermined fraction of the difference between the maximum time derivative of the pressure and zero; and multiplying the pressure at that point by a factor which is the reciprocal of the predetermined fraction; and reducing said rate of flow from the pumping system to said predetermined rate of flow.

## 4,422,943
## METHOD FOR PRECIPITATION OF HEAVY METAL SULFIDES

Ronald G. Fender, Thorndale, and Alan S. MacGregor, Chadds Ford, both of Pa., assignors to Environmental Resources Management, Inc., West Chester, Pa.

Filed May 21, 1982, Ser. No. 380,815
Int. Cl.³ C02F 1/52
U.S. Cl. 210—716 12 Claims

1. A method for the removal of heavy metal ions from an aqueous solution, comprising the steps of:

admixing an aqueous slurry of $FeS_2$ with a heavy metal ion bearing aqueous solution at a pH above 7, said slurry providing at least the stoichiometric amount of $FeS_2$ for precipitating said heavy metal ions from said solution as sulfides; and

separating said precipitated sulfides from said aqueous solution.

## 4,422,944
## CATIONIC POLYMERS SUITABLE FOR REDUCING TURBIDITY IN LOW TURBIDITY WATERS

Radhakrishnan Selvarajan, Oak Park; Edward G. Ballweber, Glenwood, and Manuel Slovinsky, Woodridge, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 253,405, Apr. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 138,045, Apr. 7, 1980, abandoned. This application Oct. 25, 1982, Ser. No. 436,537
Int. Cl.³ C02F 1/56
U.S. Cl. 210—736 7 Claims

1. A method of reducing the turbidity in low turbidity waters containing less than 1000 ppm of suspended solids which comprises adding thereto an effective amount of a flocculant consisting essentially of a water-soluble polymer prepared by reacting, under acid conditions, aniline or an alkyl substituted aniline, formaldehyde, and a polyamine selected from the group consisting of ethylene polyamines, polyalkylene polyamines, and cycloaliphatic polyamines, said water-soluble polymer having a molar ratio of aniline or alkyl substituted aniline to formaldehyde to polyamine of at least 1:2:1 to flocculate said suspended solids, and separating the flocculated solids from the water.

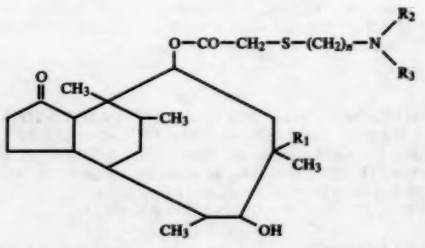
5. The method of claim 1 where the polyamine is a polyethylene polyamine resulting from the reaction of ethylene dichloride and ammonia.

## 4,422,945
## STABILIZATION OF PLEUROMUTILIN DERIVATIVES AGAINST OXIDATION BY SODIUM HYPOCHLORITE IN AQUEOUS SOLUTION

Frank Ridgway, Birkenhead, and Richard D. G. Woolfenden, Bridgend, both of England, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 241,167, Mar. 6, 1981, Pat. No. 4,390,558. This application Sep. 27, 1982, Ser. No. 424,122
Claims priority, application United Kingdom, Mar. 14, 1980, 8008792
Int. Cl.³ C02F 1/50
U.S. Cl. 210—764 7 Claims

1. A method of water treatment comprising providing an aqueous solution by providing water and adding to said water a hypochlorite scavenger and 0.0045 to 0.0125% (based on the weight of the aqueous solution) of a compound of the formula




wherein either $R_1$ is ethyl or vinyl, n is an integer from 2 to 5 and each of $R_2$ and $R_3$ is an alkyl of 1 to 10 carbon atoms, and pharmaceutically acceptable salts of said compound, said hypochlorite scavenger being selected from the group consisting of sodium thiosulphate, acetone sodium bisulphite, ascorbic acid, dithiothreitol dithioerythritol, sodium sulphite, sodium nitrate, and urea, said compound being present in a weight ratio to the hypochlorite scavenger of from about 0.1:1 to about 500:1.

4,422,946

## CALCINED α-ALUMINA FILTER AIDS

Friedrich W. Diekötter, Langenfeld, Fed. Rep. of Germany, assignor to Henkel KGaA, Duesseldorf, Fed. Rep. of Germany

Filed May 17, 1982, Ser. No. 379,107

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1981, 3121953

Int. Cl.³ B01D 37/02

U.S. Cl. 210—777 9 Claims

1. A process for filtering an alkaline solution to remove solid contaminants therefrom comprising the steps of

(a) passing the alkaline solution containing solid contaminants through a filter in the presence of calcined α-aluminum oxide as a filter aid to produce a clear filtrate; and

(b) recovering the clear filtrate produced by step (a).

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4,422,947

## WELLBORE FLUID

David L. Dorsey, and Wallace T. Corley, both of Houston, Tex., assignors to Mayco Wellchem, Inc., Houston, Tex.

Filed Dec. 19, 1980, Ser. No. 218,055

Int. Cl.³ C09K 7/02

U.S. Cl. 252—8.5 C 16 Claims

1. An aqueous wellbore fluid having improved water loss control, desirable flow characteristics, and low sensitivity to shale for use in drilling a well, comprising; water or a brine base including an effective amount of an additive consisting (1) from about 60% to about 98% by weight potato starch heteropolysaccharide crosslinked with a crosslinking compound having at least two groups that react with hydroxymethyl groups on a glucopyranose unit of potato starch, said crosslinking compound being selected from the group consisting of phosphorus oxychloride and urea-formaldehyde, (2) from about 1% to about 20% by weight of a heteropolysaccharide derived from a carbohydrate by bacteria of the genus Xanthomonas, and (3) from about 1% to about 20% by weight hydroxyethylcellulose.

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4,422,948

## LOST CIRCULATION MATERIAL

Wallace T. Corley, and David L. Dorsey, both of Houston, Tex., assignors to Mayco Wellchem, Inc., Houston, Tex.

Filed Sep. 8, 1981, Ser. No. 300,375

Int. Cl.³ C09K 7/02

U.S. Cl. 252—8.5 LC 9 Claims

1. A composition for preventing loss of drilling fluids to drilled formations to be introduced into a well penetrating the formation by a carrying liquid, said composition comprising water- and hydrocarbon-insoluble shredded paper, mineral wool and rigid granular alkaline earth metal carbonate particles as components wherein the components degrade in the presence of an acid to the extent that a permeability is restored after acidation to allow hydrocarbons to be produced from the formation;

wherein said shredded paper is present in an amount from about 3% to about 40% by weight of the composition, said mineral wool is present in an amount from about 2% to about 40% by weight of the composition, and said granular particles are present in an amount from about 20% to about 95% by weight of the composition.

4,422,949

## TEXTILE TREATMENT COMPOSITIONS AND PREPARATION THEREOF

Julius Ooms, Langdorp, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 3, 1982, Ser. No. 354,280

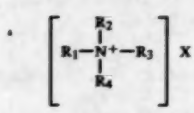
Claims priority, application United Kingdom, Mar. 7, 1981, 8107236

Int. Cl.³ D06M 13/20, 13/46

U.S. Cl. 252—8.8 14 Claims

1. An aqueous textile treatment composition from about 12% to about 25% of an active mixture consisting essentially of

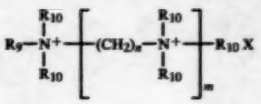
(a) from about 8% to about 22% of a substantially water-insoluble cationic fabric softener having the general formula I



I

wherein $R_1$ and $R_2$ are independently selected from the group consisting of alkyl and alkenyl groups having from about 12 to about 24 carbon atoms. $R_3$ and $R_4$ are independently selected from the group consisting of hydrogen, alkyl, alkenyl and hydroxyalkyl groups containing from about 1 to about 4 carbon atoms; and X is an equivalent amount of a counteranion,

(b) from about 0.6% to about 3% of water-soluble surfactant comprising apolyalkoxylated ammonium salt having the general formula II



II

wherein $R_9$ is selected from the group consisting of alkyl and alkenyl groups of from about 8 to about 22 carbon atoms, and each $R_{10}$ is independently selected from the group consisting of $C_1$–$C_4$ alkyl, $-(C_2H_4O)_pH$, $-(C_3H_6O)_qH$ and $-(C_2H_4O)_r(C_3H_6O)_sH$; wherein n is an integer from 2 to about 6; m is an integer from 1 to about 5; p,q,r,s, are each a number average in the range from 0 to about 14, the sum total of p,q,r, and s in the molecule being from 2 to about 14, X is an equivalent amount of a counteranion and

(c) from about 0.2% to about 5% of a fatty acid ester of a polyhydric alcohol, the ester having a total of from about 10 to about 40 carbon atoms and at least one free hydroxy group per molecule.

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4,422,950

## BLEACH ACTIVATOR GRANULES AND PREPARATION THEREOF

Hermanus C. Kemper, Brielle, and Pieter Versluis, Rotterdam, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 4, 1981, Ser. No. 327,535

Claims priority, application United Kingdom, Dec. 9, 1980, 8039373

Int. Cl.³ C11D 3/395, 7/54

U.S. Cl. 252—186.38 12 Claims

1. Effervescent bleach activator granules for use in washing and/or bleaching compositions, of a size of from 0.1 to 2.0 mm, comprising

(a) a bleach activator which in aqueous solutions reacts with a bleaching percompound which in aqueous solution releases active oxygen, to form a peroxy acid;

(b) a peroxoborate of a metal selected from the group consisting of alkali metals, alkaline earth metals and mixtures thereof which on contact with water releases molecular oxygen causing the granules to effervesce; thereby reducing losses due to incomplete dissolution to a substantial degree; and

(c) a carrier which is inert to the bleach activator and soluble or dispersible in the wash liquor.

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4,422,951

## LIQUID CRYSTAL BENZENE DERIVATIVES

Shigeru Sugimori, Fujisawashi; Tetsukiko Kojima, and Masakazu Tsuji, both of Yokohamashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Mar. 16, 1982, Ser. No. 358,794

Claims priority, application Japan, Apr. 2, 1981, 56-49688; Apr. 2, 1981, 56-49689; Aug. 18, 1981, 56-129070; Sep. 3, 1981, 56-138875; Oct. 27, 1981, 56-171696

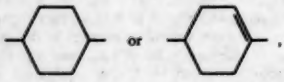
Int. Cl.³ G02F 1/13; C09K 3/34; C07C 43/21, 13/28

U.S. Cl. 252—299.63 5 Claims

1. A benzene derivative expressed by the formula

wherein R represents a hydrogen atom or an alkyl group of 1 to 10 carbon atoms; R′ represents a hydrogen atom, an alkyl group of 1 to 10 carbon atoms or an alkoxy group of 1 to 10 carbon atoms;

represents




and wherein either one of R or R′ must be an alkyl or alkoxy group.

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4,422,952

## EMULSIONS OF THE WATER-IN-OIL TYPE USEABLE AS COSMETIC SUPPORTS OR PHARMACEUTICAL EXCIPIENTS

Constantin Koulbanis, Paris; Jean-Claude Ser, Beynes, and Quang L. N'Guyen, Antony, all of France, assignors to L'Oreal, Paris, France

Filed Jul. 28, 1980, Ser. No. 172,825

Claims priority, application France, Aug. 2, 1979, 79 19841

Int. Cl.³ B01J 13/00; C09F 5/08; A61K 7/42, 7/021

U.S. Cl. 252—309 8 Claims

1. A water-in-oil emulsion comprising 20 to 75% by weight of a water phase, 20 to 75% by weight of an oil phase and as an emulsifying agent 5 to 20% by weight of a metal lanolinyl lactylate selected from the group consisting of magnesium, zinc, calcium and aluminum lanolinyl lactylate.

4,422,953

## CORROSION INHIBITION OF HALOCARBON SYSTEMS

Mark T. Grace; Michael I. Naiman, both of St. Louis, and Eddie C. French, Manchester, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Apr. 21, 1982, Ser. No. 370,330

Int. Cl.³ C23F 11/12, 11/14, 11/16

U.S. Cl. 252—392 10 Claims

1. A process of inhibiting the corrosion of a halocarbon system which comprises treating the system with an alkyl, alkenyl, or alkyl-X succinic acid or a salt thereof, where X is an oxygen, sulfur, or amino containing group.

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4,422,954

## METHOD TO RESTORE THE METAL CONTENT OF A NOBLE METAL HYDROGENATION CATALYST

Jan F. Van Peppen, Chester, Va., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 31, 1982, Ser. No. 364,109

Int. Cl.³ B01J 23/96, 23/38; C07C 45/00, 29/20

U.S. Cl. 502—25 7 Claims

1. A method to restore metal content of a supported noble metal catalyst in a reaction mass comprising adding the appropriate amount of a salt of a weak acid of said noble metal to a fluid feed passing across the catalyst wherein the feed is phenol and hydrogen.

2. The method of claim 1 wherein the catalyst is from about 0.2 to about 5 percent by weight palladium on finely divided carbon support.

3. The method of claim 2 wherein the catalyst is present in an amount between about 0.1 and 15 percent by weight of the reaction mass, phenol is present in an amount between about 1 and 99 percent by weight of the reaction mass, hydrogen is present in an amount between about 0.01 and 5 percent by weight of the reaction mass, the hydrogenation of phenol takes place at a temperature between about 120° and 200° C., a pressure between about 10 ($6.89\times10^4$ pascals) and 500 ($3.4\times10^6$ pascals) psig and a flow rate of between about 1000 (28 $m^3$) and 20 000 (560 $m^3$) cubic feed of hydrogen per minute and between about 10 (38 liters) and 150 (570 liters) gallons per minute of phenol.

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4,422,955

## PROCESS FOR SUBSTITUTION OF AROMATIC ORGANIC COMPOUNDS

Robert J. Bryant, Stanley, England, assignor to Sterling Drug Inc., New York, N.Y.

Filed Dec. 4, 1981, Ser. No. 327,714

Claims priority, application United Kingdom, Dec. 17, 1980, 8040383

Int. Cl.³ B01J 31/28, 31/30

U.S. Cl. 502—169 8 Claims

1. A catalyst for use in a process for substituting for a halogen atom attached to the nuclear carbon atom of an aromatic ring, wherein the halogen-substituted aromatic ring comprises the whole or part of a partially or wholly aromatic substrate selected from the group consisting of a monocyclic carbocyclic compound, a polycyclic carbocyclic compound, a monocyclic heterocyclic compound and a polycyclic heterocyclic compound; a substituent of the formula —O—R, wherein R represents a substituent selected from the group consisting of alkyl having from 1 to 12 carbon atoms, alkenyl having from 3 to 12 carbon atoms, alkynyl having from 3 to 12 carbon atoms and benzyl; which process comprises reacting said substrate with an alcoholate of the formula:

$$M^{a+}[O—R]_n^{\ominus}$$

wherein M represents an alkali metal atom or an alkaline earth metal atom; n is the valency of M, and R is as defined above, in the presence of a catalytically-effective amount of said

catalyst; which catalyst comprises a mixture of a formic acid ester of an organic alcohol having the formula

$$R^2—O—CO—H$$

wherein $R^2$ represents a substituent selected from the group consisting of alkyl having from 1 to 12 carbon atoms, alkenyl having from 3 to 12 carbon atoms, alkynyl having from 3 to 12 carbon atoms and benzyl; and a cuprous salt; said catalyst being substantially anhydrous and protected against oxidative breakdown.

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**4,422,956**

## ACTIVATION OF COMPLEXED REDUCED TITANIUM HALIDE OLEFIN POLYMERIZATION CATALYST WITH HALOALKYLCHLOROSILANES

**Gregory G. Arzoumanidis, Naperville, and Sam S. Lee, Hoffman Estates, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed May 14, 1982, Ser. No. 378,405**
**Int. Cl.³ C08F 4/64**
**U.S. Cl. 502—158** **32 Claims**

1. A titanium-containing olefin polymerization catalyst component formed by reducing titanium tetrachloride with an organoaluminum compound, optionally contacting the reduced solid with a pretreatment amount of alpha-olefin monomer under polymerization conditions, and reacting with a Lewis base complexing agent and a haloalkylchlorosilane.

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**4,422,957**

## METHODS OF PRODUCING POLYOLEFINS USING SUPPORTED HIGH EFFICIENCY POLYOLEFIN CATALYST COMPONENTS

**Malcolm J. Kaus, Mohegan Lake, N.Y., and Nemesio D. Miro, Woodridge, N.J., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 146,341, May 2, 1980, Pat. No. 4,347,158. This application Jun. 18, 1982, Ser. No. 389,619**
**Int. Cl.³ C08F 4/02**
**U.S. Cl. 502—177** **19 Claims**

1. In a supported high efficiency catalyst component for the polymerization of alpha-olefins to produce homopolymers or copolymers wherein the support base contains water, the improvement of the catalyst component being formed by co-comminuting a quantity of a dehydrating agent with the water containing support base, said dehydrating agent being selected from the group consisting of the silicon tetrahalides, calcium hydride and calcium carbide and being of sufficient quantity to react with water which might interfere with catalyst activity.

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**4,422,958**

## CATALYST FOR DESULFURIZATION OF INDUSTRIAL WASTE GASES AND PROCESS FOR PREPARING THE CATALYST

**Thierry Dupin, Garges les Gonesse, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France**

**Filed Mar. 1, 1982, Ser. No. 353,219**
**Claims priority, application France, Mar. 13, 1981, 81 05029**
**Int. Cl.³ B01J 21/06, 23/02, 27/02**
**U.S. Cl. 502—217** **28 Claims**

1. A catalyst composition having enhanced mechanical strength and activity, and displaying marked resistance to sulfation, consisting essentially of (i) titanium dioxide, and (ii) the sulfate of calcium, barium, strontium or magnesium.

**4,422,959**

## HYDROCRACKING PROCESS AND CATALYST

**Randy J. Lawson, Arlington Heights; Russell W. Johnson, Villa Park, and Lee Hilfman, Mt. Prospect, all of Ill., assignors to UOP Inc., Des Plaines, Ill.**

**Filed May 7, 1982, Ser. No. 376,080**
**Int. Cl.³ C10G 13/02; B01J 37/02, 21/12**
**U.S. Cl. 502—247** **4 Claims**

1. A method for the preparation of catalysts, having a hydrocracking activity, comprising a combination of a catalyst composite comprising a combination of a carrier material, a nickel component, which is incorporated in said composite by means of an aqueous nickel solution in an amount from about 0.1 to about 10 weight percent of said composite based on the elemental metal and a vanadium component which is incorporated in said catalytic composite by means of an alcoholic solution of a vanadium compound in an amount from about 0.1 to about 10 weight percent of said composite based on the elemental metal, said carrier material comprising a co-gelled silica-alumina carrier material which comprises from about 20 weight percent to about 80 ght percent silica, which method comprises:

(a) the sequential incorporation of each metal component on said carrier material; and

(b) the calcination of said carrier material following each metal component incorporation.

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**4,422,960**

## CATALYSTS FOR HYDROTREATMENT OF HEAVY HYDROCARBON OILS CONTAINING ASPHALTENES

**Yoshimi Shiroto, Yokohama; Takeo Ono, Kawasaki; Sachio Asaoka, and Munekazu Nakamura, both of Yokohama, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan**

**Filed Dec. 14, 1980, Ser. No. 210,059**
**Claims priority, application Japan, Feb. 19, 1980, 55-19596**
**Int. Cl.³ B01J 21/04, 23/22, 23/24, 27/04**
**U.S. Cl. 502—206** **30 Claims**

1. A catalyst for hydrotreating a heavy hydrocarbon oil containing asphaltenes, comprising:

a porous carrier composed of one or more inorganic oxides of at least one member selected from the group consisting of the elements belonging to Groups II, III and IV of the Periodic Table; and

one or more catalytic metal components composited with said carrier, the metal of said catalytic metal components being selected from the group consisting of the metals belonging to Groups VB, VIB, VIII and IB of the Periodic Table, said catalytic metal components being present in an amount of between about 0.1% and about 30% in terms of metal oxide based on the total weight of said catalyst, said catalyst having the following pore characteristics (a)–(c) with regard to its pores having a diameter of 75 Å or more:

(a) an average pore diameter APD being between about 180 and about 500 Å,

(b) a total pore volume PV in terms of cc/g being at least a value X calculated according to the following equation:

$$X = \frac{0.46}{1 - \left(\frac{100}{APD}\right)^2},$$

the volume of pores with a diameter of between about 180 and about 500 Å being at least about 0.35 cc/g, the volume of pores with a diameter of at least 1500 Å being not greater than about 0.03 cc/g, and

(c) a total surface area SA being at least about 104 $m^2/g$, said catalyst having an average catalyst diameter ACD of at least about 0.6 mm.

4,422,961

## RANEY ALLOY METHANATION CATALYST

Thomas J. Gray, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 353,534, Mar. 1, 1982. This application Apr. 1, 1982, Ser. No. 364,576
Int. Cl.³ B01J 25/02
U.S. Cl. 502—301 10 Claims

1. A monolithic catalyst comprised of a metallic substrate with an integral Raney metal exterior surface, said surface being predominantly derived from an adherent $Ni_xM_{1-x}Al_3$ Beta structured crystalline precursory layer, where said layer is integral with and derived from said substrate, M is a catalytic enhancer selected from the group consisting of molybdenum, titanium, tantalum, ruthenium or mixtures thereof and where x, the weight fraction of nickel in the combined weight of Ni and M, is within the range of from about 0.80 to about 0.95.

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4,422,962

## POLYGLYCOL DIELECTRIC CAPACITOR FLUID

Stanley W. Cichanowski, Bennington, Vt., assignor to General Electric Company, Hudson Falls, N.Y.

Division of Ser. No. 235,810, Feb. 19, 1981. This application Jan. 10, 1983, Ser. No. 456,661
Int. Cl.³ H01B 3/20
U.S. Cl. 252—578 9 Claims

1. An improved dielectric fluid for electrical capacitors comrising:

(a) a polyglycol fluid refined to have a moisture content below about 75 PPM and a power factor of less than about 10% measured at room temperture and 100 Hz, said polyglycol fluid being a dielectric and having a molecular weight above about 1,000; and

(b) a plurality of additives therein taken from the class consisting of:

1. a hydrogen gas absorber,
2. an anti-oxidant and
3. a voltage stabilizer.

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4,422,963

## LIGHT VALVE POLARIZING MATERIALS AND SUSPENSIONS THEREOF

Robert I. Thompson, Plainview, and Robert L. Saxe, New York, both of N.Y., assignors to Research Frontiers Incorporated, Plainview, N.Y.

Continuation-in-part of Ser. No. 795,760, May 11, 1977, abandoned. This application Nov. 15, 1978, Ser. No. 960,842
Int. Cl.³ G02F 1/07
U.S. Cl. 252—583 2 Claims

1. A light polarizing perhalide of an alkaloid acid salt having incorporated in its molecular structure at least one halide of the formula

$$MX_n$$

wherein M is rubidium or cesium, X is chlorine, bromine or iodine and n is the valence of M, said perhalide being the reaction product of an alkaloid acid salt, elemental iodine and said halide.

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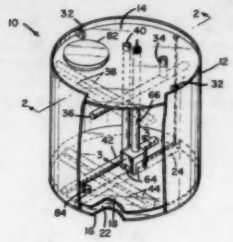
4,422,964

## RADIOACTIVE WASTE CONTAINER WITH IMMOBILIZATION COMPARTMENT AND METHOD

Richard E. Capolupo, Salisbury, Mass., assignor to Capolupo & Gundal, Inc., Salisburg, Mass.

Filed Nov. 30, 1981, Ser. No. 325,683
Int. Cl.³ G21F 9/16
U.S. Cl. 252—628 52 Claims

1. A unitary waste storage container including a solid waste storage compartment, a liquid waste storage compartment located below and joined to the solid waste storage compartment, a liquid drainage passage connecting the compartments and a closure extending across the passage to close the passage during filling of the solid waste storage compartment and an operator for moving the closure to a position opening the



passage thereafter to permit liquid from the waste in the solid waste storage compartment to drain into the liquid waste storage compartment.

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4,422,965

## NUCLEAR WASTE ENCAPSULATION IN BOROSILICATE GLASS BY CHEMICAL POLYMERIZATION

Ronald W. Chickering, Hempfield Township, Westmoreland County; Bulent E. Yoldas, Churchill, and Bruce H. Neuman, Salem Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 11, 1980, Ser. No. 176,738
Int. Cl.³ G21F 9/16
U.S. Cl. 252—629 11 Claims

1. A method of encapsulating an aqueous solution of nuclear waste, comprising:

(A) adjusting the pH of said solution of nuclear waste to about 4 to about 6;

(B) preparing a composition in an alcohol which consists essentially of:

(1) about 1 to about 99% by weight of a silicon compound having the general formula $Si(OR)_4$ where each R is independently selected from alkyl to $C_6$; and

(2) about 1 to about 99% by weight of a boron compound having the general formula $B(OR)_3$ where each R is independently selected from alkyl to $C_6$, said composition being partially hydrolyzed;

(C) adjusting the pH of said composition to about the pH of said solution of nuclear waste;

(D) drying said composition to about 50 to about 75% of its original volume;

(E) mixing together up to about 30% by weight of said solution of nuclear waste with said composition, based on total weight, to form a gel;

(F) drying the mixture at a temperature between room temperature and the boiling point of said alcohol;

(G) heating said mixture at up to 500° C.;

(H) consolidating said mixture by

(1) warm pressing at about 400 to about 800° C. at about 40,000 to about 100,000 psi; or

(2) melting said mixture at about 700° to about 1150° C.

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4,422,966

## SEPARATION OF NEUTRALS FROM TALL OIL SOAPS

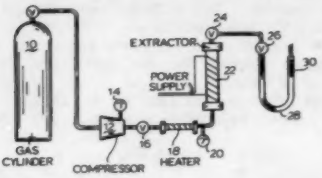
Gamal I. Amer, Lawrenceville, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Mar. 18, 1983, Ser. No. 476,599
Int. Cl.³ C09F 1/00
U.S. Cl. 260—97.6 7 Claims

1. A process for separating neutral compounds from tall oil soaps, which comprises;

contacting tall oil soap with a supercritical fluid solvent for the

tall oil neutral compounds whereby neutrals are extracted into said solvent to form a mixture of solvent and extract;




separating the mixture from the remainder of the contacted soap; and

separating the solvent from the mixture.

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**4,422,967**

## PURIFICATION OF CALCITONIN BY PARTITION CHROMATOGRAPHY

**Ronald C. Orlowski, Frankfort, Ill.; Charles M. Groginsky, Tucson, Ariz., and Jay K. Seyler, Bourbonnais, Ill., assignors to Armour Pharmaceutical Company, Tuckahoe, N.Y.**

**Continuation-in-part of Ser. No. 189,812, Sep. 22, 1980, Pat. No. 4,336,187, which is a continuation-in-part of Ser. No. 94,323, Nov. 14, 1979, abandoned. This application May 19, 1982, Ser. No. 379,853**

**The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.**

**Int. Cl.³ C07C 103/52**

**U.S. Cl. 260—112.5 T** **12 Claims**

1. In a process for purifying crude ultimobranchial calcitonin the step of subjecting said crude ultimobrancial calcitonin to partition chromatography using a solvent mixture containing (1)n-butanol (2) a lower aliphatic alcohol selected from the group consisting of ethanol, methanol, propanol and mixtures thereof (3) acetic acid or formic acid or mixtures thereof, or ammonia and (4)ammonium acetate or ammonium formate or mixtures thereof, said solvent mixture having a pH of from 5.5 to 7.0.

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**4,422,968**

## β-ENDORPHIN ANALOGS

**Choh Hao Li, Berkeley, Calif., assignor to The Regents of the University of California, Berkeley, Calif.**

**Filed Sep. 13, 1982, Ser. No. 416,998**

**Int. Cl.³ C07C 103/52**

**U.S. Cl. 260—112.5 E** **3 Claims**

1. Analogs of β-endorphin of the formula

[D-Ala$^2$,Phe$^3$,Gly$^4$,Tyr$^5$,Pro$^6$]-β-endorphin

and the pharmaceutically acceptable acid addition salts thereof.

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**4,422,969**

## CATIONIC STYRYL DYESTUFFS

**Hermann Beecken, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

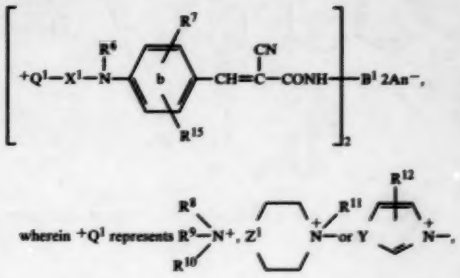
**Filed Oct. 20, 1981, Ser. No. 313,111**

**Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 3040911**

**Int. Cl.³ C07D 213/57; C07C 121/78**

**U.S. Cl. 260—152** **4 Claims**

1. A cationic styryl dyestuff of the formula



wherein $^+Q^1$ represents



and wherein

$R^8$, $R^9$, $R^{10}$ and $R^{11}$, independently of one another, represent hydrogen or $C_1$- to $C_4$-alkyl, which can be substituted by hydroxyl, amino, formylamino, $C_1$- to $C_4$-alkoxy, hydroxy-$C_2$- to $C_4$-alkoxy, phenyl, phenyloxy, $C_1$- to $C_3$-alkylcarbonyloxy, fluorine, chlorine or bromine, and

$R^8$ additionally represents $C_1$- to $C_4$-alkoxy, amino, formylamino, phenyl, cyclopentyl or cyclohexyl,

$Z^1$ represents a direct bond, $CH_2$, $C_2H_4$, O, S, NH or N—$C_1$- to $C_2$-alkyl,

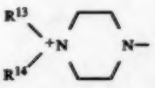
$R^{12}$ represents 1 to 3 radicals from the series comprising hydrogen, $C_1$- to $C_4$-alkyl, fluorine, chlorine or bromine,

Y represents O, S, NH, N—$C_1$- to $C_2$-alkyl or CH=CH,

$X^1$ represents $C_2$- to $C_3$-alkylene, which is optionally branched and/or substituted by hydroxyl, $C_1$- to $C_4$-alkoxy or phenyl, and

$R^6$ represents $C_1$- to $C_4$-alkyl, which is optionally substituted by chlorine, cyano, $C_1$- to $C_4$-alkyloxy, phenyl or phenyloxy or $R^6$ represents phenyl or the radical —X—$Q^{+\cdot}$ $^1An^-$, or

$R^6$ with —X—$Q^{+1}$ and the N atom, to which both are bonded, together form a piperazinium system of the structure



$R^{13}$ represents hydrogen or $C_1$- to $C_4$-alkyl, which can be substituted by $C_1$- to $C_4$-alkyloxy, hydroxyl, $C_1$- to $C_3$-alkylcarbonyloxy or phenyl,

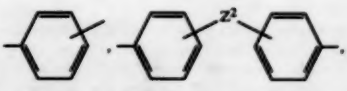
$R^{14}$ represents $C_1$- to $C_4$-alkyl, or

$R^{13}$ and $R^{14}$ together represent $(CH_2)_4$ or $(CH_2)_5$, or

$R^6$ and $R^7$, together with the benzene ring and the nitrogen atom to which $R^6$ is bonded, are constituents of an indoline, 1,2,3,4-tetrahydroquinoline or 2,3-dihydro-1,4-benzoxazine ring system, which is optionally substituted in the heterocyclic ring by 1 to 4 $C_1$- to $C_4$-alkyl groups or by a phenyl radical, or

$R^7$ and $R^{15}$, independently of one another, denote hydrogen, $C_1$- to $C_2$-alkyl, $C_1$- to $C_2$-alkyloxy, bromine or chlorine, and

$B^1$ represents



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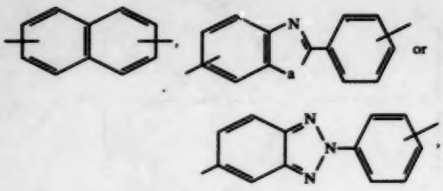
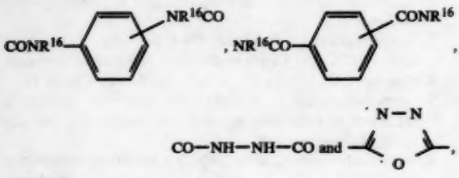


wherein

$Z^2$ designates a direct bond or a connecting member from the series O, S,

$(CH_2)_2$, CH=CH, $CH_2O$, $CH_2OCH_2$, $NR^{16}$, N=N, $NR^{16}CO$, $NR^{16}CONR^{16}$, $NR^{16}CO(CH_2)_{1-4}CONR^{16}$, $CONR^{16}CO$, $NR^{16}SO_2$,



and

$R^{16}$ and $R^{16a}$, independently of one another, represent $C_1$- to $C_2$-alkyl and, particularly, hydrogen, and in the case of

also together represent $(CH_2)_4$ or $(CH_2)_5$,

a represents O, S or $NR^{16}$ and

$An^-$ represents an anion,

wherein phenylene nuclei are present as 1,3- or 1,4-phenylene, and the phenyl radicals and phenylene, naphthylene and fused benzoid nuclei mentioned can additionally be substituted by 1 to 3 $C_1$- to $C_4$-alkyl groups, $C_1$- to $C_4$-alkyloxy groups, $C_1$- to $C_4$-alkyloxycarbonyl groups, cyano groups or $CF_3$ groups and/or Br or Cl.

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4,422,970

## METHOD OF SYNTHESIS OF 1-DODECYLAZACYCLOHEPTAN-2-ONE

Vithal J. Rajadhyaksha, Mission Viejo; James V. Peck, Costa Mesa, and Gevork Minaskanian, Encino, all of Calif., assignors to Nelson Research & Development Company, Irvine, Calif.

Filed May 20, 1982, Ser. No. 380,162
Int. Cl.³ C07D 223/10
U.S. Cl. 260—239.3 R 4 Claims

1. The method of synthesis of 1-dodecylazacycloheptan-2-one comprising reacting under aqueous conditions azacycloheptan-2-one with 1-bromo-dodecane in the presence of a catalytic amount of tricaprylylmethyl-ammonium chloride.

4,422,971

## PROCESS FOR THE PREPARATION OF 6-AMINOPENICILLANIC ACID-1,1-DIOXIDE

Piet J. Akkerboom, RT Zoetermeer, and Christophorus Oldenhof, TM Zoetermeer, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

PCT No. PCT/NL80/00039, § 371 Date Aug. 4, 1981, § 102(e) Date Aug. 4, 1981, PCT Pub. No. WO81/01707, PCT Pub. Date Jun. 25, 1981
PCT Filed Dec. 10, 1980, Ser. No. 293,621
Claims priority, application Netherlands, Dec. 10, 1979, 7908867
Int. Cl.³ C07D 499/04, 499/42
U.S. Cl. 260—245.2 R 9 Claims

1. A proçess for the preparation of 6-amino-penicillanic acid-1,1-dioxide comprising protecting the 3-carboxylic acid of a penicillin-1,1-dioxide with an easily removable silicon, phosphorus or boron containing residue, reacting the latter with an imino halogenating agent to form the corresponding 6-imino compound, reacting the latter with an alcohol of the formula R—OH wherein R is selected from the group consisting of alkyl of 1 to 6 carbon atoms and aralkyl with 1 to 6 alkyl carbon atoms to form the corresponding imino ether and hydrolyzing the latter to obtain 6-amino-penicillanic acid-1,1-dioxide.

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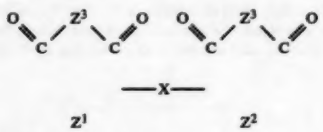
4,422,972

## NOVEL LIGHT-SENSITIVE COMPOUNDS AND PHOTOREACTABLE COMPOSITIONS COMPRISING SAME

Robert C. Daly, Rochester; Danny R. Thompson, Fairport, and Samir Y. Farid, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 180,211, Aug. 21, 1980, Pat. No. 4,302,527.
This application May 4, 1981, Ser. No. 260,434
Int. Cl.³ C07C 49/72
U.S. Cl. 260—368 9 Claims

1. A light-sensitive compound having a structural formula



wherein

$Z^1$ and $Z^2$ are each independently the number of non-metallic atoms necessary to complete 1, 2, 3, or 4 unsaturated carbocyclic rings of from 6 to 18 nuclear atoms;

$Z^3$ is either a carbon-to-carbon bond or vinylene;

and X is a linking group.

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4,422,973

## PROCESS FOR THE PREPARATION OF 1,4-DIAMINO-2,3-DICYANO-ANTHRAQUINONE

Friedrich W. Kröck, Cologne, and Rütger Neeff, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Del.X

Filed Jan. 15, 1981, Ser. No. 225,544
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1980, 3003656
Int. Cl.³ C07C 97/24
U.S. Cl. 260—382 10 Claims

1. A process for the preparation of 1,4-diamino-2,3-dicyano-anthraquinone comprising in a first step reacting 1-amino-4-bromo-anthraquinone-2-sulphonic acid, or its salts, with ammonia in formamide or N-methyl-formamide as a solvent and thereafter, without isolation, in a second step reacting the resulting product with compounds which yield cyanide ions.

4,422,974

## PROCESS FOR THE PURIFICATION OF β-SITOSTEROL ISOLATED FROM THE UNSAPONIFIABLES IN CRUDE SOAP FROM THE SULPHATE CELLULOSE PROCESS

Antti Hamunen, Lappeenranta, Finland, assignor to OY Kaukas AB, Finland

Filed Jul. 8, 1982, Ser. No. 396,335
Claims priority, application Finland, Jul. 21, 1981, 812279
Int. Cl.³ C07J 9/00
U.S. Cl. 260—397.25 4 Claims

1. A process for isolating beta-sitosterol containing less than 5% alpha-sitosterol from a sterol mixture isolated from the unsaponifiables in crude soap derived from the sulphate cellulose process, comprising:

(a) adding to the sterol mixture one organic solvent and water, said organic solvent selected from the group consisting of 1,2-dichloroethylene, methyl ethyl ketone and ethyl acetate, the sterol mixture and the organic solvent having a weight ratio between about 1:3 and about 1:20, and wherein the amount of water is greater than 2% of the organic solvent,

(b) heating the admixture obtained from step (a) until the sterol mixture is dissolved,

(c) precipitating a product rich in beta-sitosterol by cooling the admixture to at least room temperature, and

(d) separating the precipitated product rich in beta-sitosterol from the solution by filtration.

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4,422,975

## ORGANIC SALT COMPOSITIONS IN EXTRACTION PROCESSES

Howard L. Mitchell, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 3, 1981, Ser. No. 289,323
Int. Cl.³ C07F 5/06
U.S. Cl. 260—448 AD 20 Claims

1. A composition of matter, being a solid salt, of the formula:

[C] [A]

wherein [C] is a monovalent or divalent cation selected from the group consisting of the formulae:

$[R_4Q]$

$[R_3R'Q]$

$[R_3Q\text{-}L\text{-}QR_3]$, and

[A] is a monovalent or divalent anion or a solid polyanionic metal oxide selected from the group consisting of the formulae:

$[R''_4M]$

[AS]

$[R''_3M\text{-}L'\text{-}MR''_3]$

wherein

Q is independently N, P or As;

R is independently selected from the group consisting of phenyl, naphthyl, biphenylyl, and their monochloro and monomethyl derivatives;

R' is independently selected from the group consisting of benzyl, naphthylmethyl, and their monochloro and monomethyl derivatives; linear and branched $C_6$–$C_{12}$ alkyl; cyclopentyl, cyclohexyl, adamantyl, bicyclooctyl, their monomethyl, dimethyl, partially fluorinated and partially chlorinated derivatives;

R'' is independently selected from the group consisting of phenyl, naphthyl, phenoxy, naphthoxy, and their methyl, polymethyl, chloro, polychloro, fluoro and polyfluoro derivatives;

L is $—CH_2(p—C_6H_4)CH_2—$;

L' is $p\text{-}C_6H_4$;

M is B or Al;

[AS] comprises a solid polyanionic metal oxide in which the metal is independently selected from the group consisting of Al, Si, Ti, Zr, Th, Hf, W, B and mixtures thereof; and wherein the number of cations and anions are sufficient to render the salt electrically neutral.

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4,422,976

## CONTINUOUS PREPARATION OF ORGANIC ISOCYANATES

Ryuichi Yamamoto; Akinobu Takagi; Masafumi Katsuta; Kenji Obata, and Shigeki Mori, all of Ohmuta, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Japan

Filed Apr. 2, 1982, Ser. No. 364,894
Claims priority, application Japan, Apr. 7, 1981, 56-51216; Nov. 18, 1981, 56-183734
Int. Cl.³ C07C 118/02
U.S. Cl. 260—453 PH 12 Claims

1. In a process for continuously preparing an organic isocyanate by reacting a corresponding organic primary amine and stoichiometrically excess phosgene in an inert organic solvent, the improvement which comprises the steps of:

(a) bringing the organic primary amine in a practically dispersed state into contact with phosgene at a gauge pressure of 2–7 $Kg/cm^2$ and a temperature in the range of 60°–100° C., thereby forming a corresponding organic carbamyl chloride, converting the bi-produced hydrochloric acid salt of said amine, and phosgene into the organic carbamyl chloride and decomposing 30–70% of the thus-formed organic carbamyl chloride present in the reaction mixture into the organic isocyanate; and

(b) maintaining the resultant reaction mixture at a gauge pressure of 3–7 $Kg/cm^2$ and a temperature in the range of 120°–160° C., thereby converting the hydrochloric acid salt of said amine and phosgene present in the reaction mixture into the organic carbamyl chloride and completing the decomposition of said organic carbamyl chloride into said organic isocyanate.

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4,422,977

## HYDROESTERIFICATION OF 1-ALKENE

Paul Foley, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jan. 26, 1982, Ser. No. 342,636
Int. Cl.³ C07C 153/017
U.S. Cl. 260—455 R 29 Claims

1. A process for hydroesterification of 1-alkene which consisting essentially of (1) reacting 1-alkene with carbon monoxide and hindered thiol compound in a liquid medium containing a halide-free catalyst complex of palladium and tertiary hydrocarbylphosphine ligand; and (2) recovering alkyl thioloalkanoate product.

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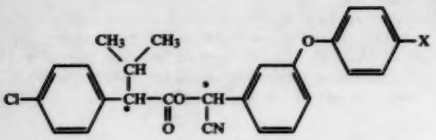
4,422,978

## METHOD FOR PREPARING OPTICALLY ACTIVE CARBOXYLIC ACID ESTERS

Yukio Suzuki; Masahiro Hayashi, both of Toyonaka, and Kenzi Takuma, Nara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 20, 1981, Ser. No. 313,089
Claims priority, application Japan, Oct. 20, 1980, 55-147265; Apr. 15, 1981, 56-56115
Int. Cl.³ C07C 121/75
U.S. Cl. 260—465 D 59 Claims

1. A method for preparing an optically active carboxylic acid ester of the formula (I):



(I)

wherein X is a hydrogen atom or a fluorine atom, and * indicates an asymmetric carbon atom, which is an Aα-isomer having an (S)-configuration on both the acid and alcohol moieties, or rich in said Aα-isomer, which method comprises crystallizing said Aα-isomer from a solution of an A-isomer of the compound of formula (I) having an (S)-configuration on the acid moiety in the presence of a crystal of substantially pure Aα-isomer and in the absence of any crystal of the A-isomer and in the presence or absence of a basic catalyst, wherein the solution of the A-isomer is heated to a temperature of 40° C. or higher before the Aα-isomer is crystallized from that solution.

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**4,422,979**

## FLUORO-SUBSTITUTED BIPHENYLYL COMPOUNDS AND PROCESSES

**Edward J. Zaiko, Cary, N.C., and Paul F. Ranken, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.**

**Division of Ser. No. 189,779, Sep. 22, 1980, Pat. No. 4,371,473, which is a division of Ser. No. 53,060, Jun. 28, 1979, Pat. No. 4,278,516. This application Apr. 16, 1982, Ser. No. 369,339**

**Int. Cl.³ C07C *121/66, 53/23***

**U.S. Cl. 260—465 D** **5 Claims**

1. A method for the preparation of 2-(2-fluoro-4-biphenylyl)-propionic acid which comprises

(a) reacting a mixture of 2-amino-4-methylbiphenyl, a fluoridizing agent and a diazotizing agent to form 2-fluoro-4-methylbiphenyl,

(b) reacting said 2-fluoro-4-methylbiphenyl with N-bromosuccinimide or bromine under irradiation with light to form 2-fluoro-4-monobromomethylbiphenyl,

(c) reacting said 2-fluoro-4-monobromomethylbiphenyl with an alkali metal cyanide to form 2-(2-fluoro-4-biphenylyl-)acetonitrile,

(d) reacting a mixture of said acetonitrile, a dialkyl carbonate and an alkali metal alkoxide, and then adding a methylating agent to form alkyl-2-(2-fluoro-4-biphenylyl)-2-cyano-propionate,

(e) reacting said cyanopropionate, an alkali metal alkoxide and an alcohol to form 2-(2-fluoro-4-biphenylyl)propionitrile, and then

(f) reacting a mixture of said propionitrile and an alkali metal hydroxide in an aqueous-organic medium to form 2-(2-fluoro-4-biphenylyl)propionic acid.

3. Ethyl-2-(2-fluoro-4-biphenylyl)-2-cyanopropionate.

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**4,422,980**

## ACRYLIC DIMERIZATION USING SUPPORTED CATALYSTS

**R. K. Grasselli, Chagrin Falls; J. D. Burrington, Richmond Heights; F. A. Pesa, Aurora, and H. F. Hardman, Lyndhurst, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio**

**Filed Aug. 10, 1981, Ser. No. 291,708**

**Int. Cl.³ C07C *121/26, 121/30, 121/00***

**U.S. Cl. 260—465.8 D** **10 Claims**

1. A process for dimerizing acrylonitrile to produce adiponitrile and/or 1,4-dicyanobutenes comprising contacting acrylonitrile with a catalyst at a temperature of 20° to 250° C. in the presence of hydrogen, said catalyst comprising a polymer support having a ruthenium complex bonded thereto, said polymer support comprising an organic polymer backbone having trivalent P pendant atoms covalently bonded thereto and randomly distributed in said polymer, said ruthenium complex being capable of catalyzing the dimerization of acrylonitrile to adiponitrile and/or 1,4-dicyanobutenes and comprising Ru and at least two homogeneous ligands having at least four ligating bonds bonding to said Ru, the Ru in each ruthenium complex datively bonding to a pendant atom in said polymer support, the Ru/pendant atom ratio in said catalyst being at least 0.001, said complex being substantially free of homogeneous phosphine ligands.

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**4,422,981**

## PROCESS FOR PRODUCTION OF 2-METHYLENEGLUTARONITRILE

**Hiroyuki Omori, Yokkaichi; Makoto Takeda, Ami; Koichi Fujita, Matsusaka, and Mitsugi Katsoka, Yokkaichi, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan**

**Filed Mar. 24, 1982, Ser. No. 361,379**

**Claims priority, application Japan, Mar. 25, 1981, 56-43715**

**Int. Cl.³ C07C *121/20, 120.00***

**U.S. Cl. 260—465.8 D** **11 Claims**

1. In a process for production of 2-methyleneglutaronitrile by the dimerization of substantially anhydrous acrylonitrile by contacting said acrylonitrile in a liquid phase with a catalyst composed of a trialkylamine and a metal halide of the formula $MeX_n$, wherein Me represents aluminum, titanium, vanadium, iron, cobalt or zinc; X is chlorine, bromine or iodine; and n is an integer equal to the valence of the metal Me, the improvement comprising the steps of:

(a) contacting the resulting liquid reaction product while being agitated with an aromatic hydrocarbon selected from the group consisting of benzene, toluene and xylene and added water;

(b) separating the resulting aromatic hydrocarbon phase from the mixture; and

(c) recovering 2-methyleneglutaronitrile from the aromatic hydrocarbon phase, the quantities of the aromatic hydrocarbon and the water being, respectively, 1 to 50-fold by weight and 1 to 10% by weight relative to the amount of liquid reaction product, said water being added to effect the contact step no earlier than the contact of the liquid reaction product with said aromatic hydrocarbon thereby forming a mass which comprises the catalyst component and a polymeric material which precipitates when the mass is not agitated.

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**4,422,982**

## METHOD FOR PREPARATION OF N-PHOSPHONOMETHYLGLYCINE

**N. Subramanian, San Leandro, Calif., assignor to Stauffer Chemical Company, Westport, Conn.**

**Filed Jun. 30, 1982, Ser. No. 393,574**

**Int. Cl.³ C07F *9/38***

**U.S. Cl. 260—502.5 F** **11 Claims**

1. A method for the production of N-phosphonomethylglycine which comprises the steps of:

(a) adding about one mole of formaldehyde to about two moles of formamide at a pH of between 9 and 10, to form N-(hydroxymethyl)formamide,

(b) reacting N-(hydroxymethyl)formamide with triethyl phosphite in about a 1:1 mole ratio to form diethyl, N-(formyl)aminomethylphosphonate,

(c) reacting diethyl, N-(formyl)aminomethylphosphonate with methylchloroacetate in about a 1:1 mole ratio in the presence of a suitable solvent and a proton-extracting base to form N-(diethylphosphonomethyl), N-(formyl)glycine-methyl ester, and

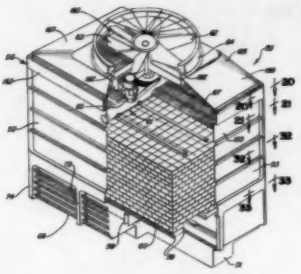
(d) reacting N-(diethylphosphonomethyl) N-(formyl)glycine methyl ester with a hydrolyzing agent to form N-phosphonomethylglycine.

4,422,983

## FIBERGLASS REINFORCED COOLING TOWER

Charles J. Bardo, Arlington, and Andrew Green, Galveston, both of Tex., assignors to Ceramic Cooling Tower Company, Fort Worth, Tex.

Filed Jun. 16, 1982, Ser. No. 388,906
Int. Cl.³ B01F 3/04
U.S. Cl. 261—24 32 Claims



1. A liquid cooling tower comprising four generally rectangular vertically extending side panels formed of fiberglass reinforced polyester resin, the four side panels being arranged in two pairs of opposed parallel panels to provide a generally rectangular enclosure, at least one support beam extending between one pair of opposed side panels and secured thereto, each support beam being formed of fiberglass reinforced polyester resin, a plurality of lintels extending generally perpendicularly to the support beam, means on the other pair of opposed side panels for supporting the lintels, each end of each lintel being supported by either a support beam or by the lintel support means of a side panel, porous means for heat/mass exchange within said enclosure and supported by the lintels for permitting air and liquid to pass through the exchange means, a top portion supported by the side panels and having an air opening therein, a fan in the air opening supported by the top portion, and liquid distribution means within the enclosure for supplying liquid to the exchange means.

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4,422,984

## CENTRIFUGAL CASTING OF CONTACT LENSES

Charles W. Neefe, 811 Scurry St., Box 429, Big Spring, Tex. 79720

Filed Sep. 13, 1982, Ser. No. 417,555
Int. Cl.³ B29D 11/00
U.S. Cl. 264—2.1 10 Claims

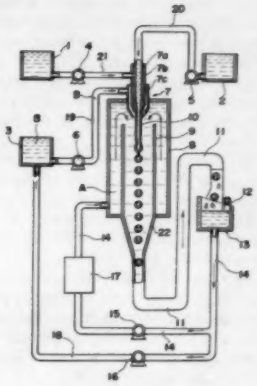
1. A method of centrifugal casting optical lenses by the steps of, placing a selected liquid lens monomer between an inner mold and an outer mold, revolving a plurality of these lens molds around a common center with the lens optical axis passing through the common center of rotation, allowing the liquid lens monomer to begin polymerization and the liquid monomer viscosity to increase to form a syrup, adding rotational power to increase the speed of rotation of the lens molds around their common center and allowing the polymerization to proceed and the volume of lens monomer to decrease and the speed of rotation of the lens molds to increase until a solid resinous lens fills the space between the lens molds allowing the rotation to cease and removing the finished lens from the lens molds.

4,422,985

## METHOD AND APPARATUS FOR ENCAPSULATION OF A LIQUID OR MELTABLE SOLID MATERIAL

Takashi Morishita, Nishinomiya; Hideki Sunohara, Osaka, and Shinsuke Sonoi, Itami, all of Japan, assignors to Morishita Jintan Co., Ltd., Osaka, Japan

Filed Sep. 24, 1982, Ser. No. 423,102
Int. Cl.³ A61J 5/04
U.S. Cl. 264—4.4 2 Claims



1. A method for encapsulation of a liquid or meltable solid material, comprising the steps of forming a jet of a material to be encapsulated, simultaneously forming a coaxial jet of a capsule-forming material surrounding the jet of the material to be encapsulated, forming a coaxial jet of a heated circulating liquid surrounding the coaxial composite jet of the capsule-forming material and the material to be encapsulated, introducing the resultant coaxial triple jet into a flow of a cooling liquid to form capsules composed of a core of the material to be encapsulated and a capsule or coating film of the capsule-forming material, said heated circulating liquid has a temperature close to or higher than that of the capsule-forming material.

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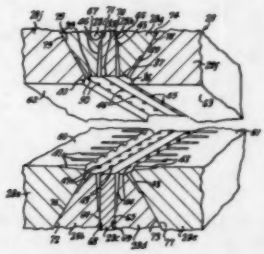
4,422,986

## METHOD AND APPARATUS FOR INFECTION MOLDING BRUSHES

William E. Cole, Residence Europea, Monte Carlo, Monaco

Filed Sep. 23, 1981, Ser. No. 304,836
Int. Cl.³ B28B 7/04
U.S. Cl. 264—39 5 Claims



1. A method of injection molding at least a part of a brush including a stem and a plurality of rows of bristles extending longitudinally along the stem, the bristles in at least one row extending outwardly from the stem at an angle which is differ-

ent than the angle at which the bristles from at least one other row extend from said stem, said method comprising the steps of clamping a plurality of mold pieces together in mold defining positions to form a mold defining the said at least part of a brush and in which each bristle forming cavity is defined by the juxtaposed surfaces of at least two separate mold pieces, injecting molten material into the mold to fill the mold including all of the bristle forming cavities therein, permitting the molten material to solidify, and opening of the mold by separating at least one set of mold pieces from at least one other mold piece to permit removal of the molded part of a brush, at least the majority of said mold pieces being retained in their said mold defining positions relative to each other during ejection molding and removal of the said molded part of a brush, and, when needed, separating the mold pieces defining any bristle forming cavity for purposes of cleaning foreign material therefrom.

4. A mold for injection molding at least part of a brush having a stem and a plurality of rows of bristles extending longitudinally along the stem, the bristles in at least one row extending outwardly from the stem at an angle which is different than the angle at which the bristles from at least one other row extend from said stem, said mold comprising a plurality of mold pieces which form bristle forming cavities for molding of the individual bristles, each bristle forming cavity being defined by the juxtaposed surfaces of at least two separate mold pieces, clamping means for clamping the said plurality of mold pieces together in mold defining positions to form a mold for injection molding of said at least part of a brush, said clamping means retaining at least the majority of said mold pieces in their said mold defining positions during removal of the molded part of a brush, at least a portion of one of the mold pieces defining an ejector rod and being movable relative to its adjacent mold pieces for sliding a molded part of a brush out of engagement with the mold to simplify its removal from the mold, and means for releasing said clamping means to separate the juxtaposed surfaces defining any bristle forming cavity for cleaning any said bristle forming cavity.

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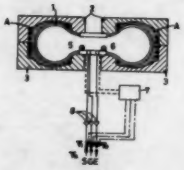
**4,422,987**

## METHOD FOR VULCANIZING AN ELASTOMER

**Toshio Arimatsu, Akashi, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan**

**Filed Nov. 16, 1981, Ser. No. 321,929**
**Claims priority, application Japan, Jul. 24, 1981, 56-116644**
**Int. Cl.³ B29H 5/01**
**U.S. Cl. 264—40.1** **3 Claims**



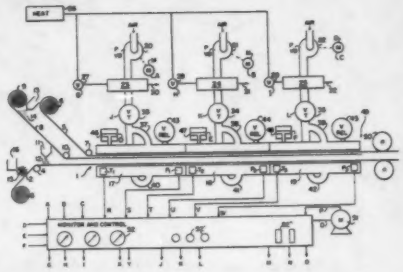
1. In a method for vulcanizing an elastomer set in a vulcanizing chamber by use of a fluid of a low enthalpy gas and a high thermal capacity fluid, the improvement wherein the said gas and thermal fluid are mixed directly in the vulcanizing chamber and controlled under optimal pressure and temperature conditions suitable for vulcanizing the elastomer by means of a controller which operates in response to a pressure sensor and temperature sensor located within the vulcanizing chamber.

**4,422,988**

## FLUID FILM CONTINUOUS PROCESSING METHOD AND APPARATUS

**Andrew T. Kornylak, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio**

**Continuation-in-part of Ser. No. 954,448, Oct. 25, 1978, Pat. No. 4,278,624. This application Jul. 13, 1981, Ser. No. 282,510**
**The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.**
**Int. Cl.³ B29D 27/04**
**U.S. Cl. 264—40.3** **7 Claims**



1. Apparatus for continuously processing an endless web moving in the longitudinal direction of the web comprising:

a base;

a first, generally planar, normally stationary, process surface mounted on said base;

a second, generally planar normally stationary, process surface mounted on said base to be spaced from and parallel to said first process surface;

each of said first and second process surfaces being composed of a plurality of sections serially arranged in longitudinal direction of the apparatus corresponding to the processing direction with an entrance end and an exit end for the web;

a plurality of holes extending over substantially the entire first and second process surfaces in a fixed pattern;

means operatively associated with said process surfaces forming a separate plenum chamber for each of said surface sections on the side of each of said surfaces opposite from the other surface so that all of said holes within each surface section open up into their corresponding plenum chamber;

means operatively associated with said plenum chambers for supplying pressurized fluid separately to each of said plenum chambers so that the fluid will exit from said holes and form fluid films respectively along said process surfaces sufficient to form an anti-friction fluid bearing for the web;

side supports closing the side space between each longitudinal side of the first and second process surfaces to form therewith a generally four-sided closed stationary tube extending for substantially the full longitudinal length of the apparatus and being open at opposed entrance and exit ends;

feeding means operatively associated with said process surfaces for engaging the endless web and for continuously moving the web through the apparatus;

means operatively associated with said process surfaces for depositing foamable chemicals at said entrance end of the apparatus to produce a continuous web of synthetic foam;

means operatively associated with said apparatus for separately monitoring a physical characteristic of the fluid for each surface section and providing a correlated monitor signal;

central monitor and control means operatively associated with said apparatus for receiving all of said monitor signals, comparing said monitor signals respectively to sepa-

rate fixed reference signals of a stored profile of reference characteristic value versus longitudinal length and producing respective control signals correlated to the comparison for each monitor location;

a plurality of separate means operatively associated with each of said plenum chambers for controlling the characteristic of the fluid being supplied to its plenum chamber in accordance with a temperature control signal; and

said control means operating said separate means in a fixed sequential order only so long as said comparison signal is different than a fixed value as determined after a delay correlated to each operation of the sequence.

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**4,422,989**

## METHOD OF PRODUCING HYDROTHERMALLY CURED AERATED CONCRETE BUILDING UNITS

**Dieter Huma, Schrobenhausen; Armin Hartmann, Rheinau; Klaus F. Lippe, Aresing, and Werner Wetzig, Messel, all of Fed. Rep. of Germany, assignors to Intong AB, Kumla, Sweden**

**Continuation of Ser. No. 937,749, Aug. 29, 1978, abandoned. This application Dec. 15, 1980, Ser. No. 216,381**

**Claims priority, application Fed. Rep. of Germany, Aug. 31, 1977, 2739181**

**Int. Cl.³ C04B *15/04, 31/02***

**U.S. Cl. 264—42** **3 Claims**

1. In a method of producing gas concrete in which a mass comprising water, lime, rising agent, cement, and sand, said mass being suitable for production of gas concrete, is cast into a mold where it is permitted to rise and harden into a mass capable of being cut into a desired shape and wherein the hardened material is hydrothermally cured with steam in an autoclave to form a gas concrete product, the improvement wherein said castable mass is prepared by the steps of:

providing water in a mixing vessel, adding lime, cement, and sand to the water in the mixing vessel while stirring and mixing for 40 to 80 seconds, said lime and cement together forming a binding agent in which the lime is predominant;

mixing a calcium sulphate-containing component with said homogeneous pre-mixture for 30 to 35 seconds to form a homogeneous calcium sulphate-containing mixture, said calcium sulphate-containing component being selected from the group consisting of calcium sulphate anhydrite and gypsum and being present in an amount of 6–12% by weight $SO_3$ based on the weight of CaO in said lime;

mixing a rising agent with said homogeneous calcium sulphate-containing mixture for 20 to 40 seconds to form said castable mass; and

after mixing is completed, retaining the castable mass in the mixing vessel until rising starts.

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**4,422,990**

## METHOD AND APPARATUS FOR MAKING SOIL PLUGS

**Errol C. Armstrong, Mountain View; William A. Hanacek, Salinas, both of Calif.; Paul F. Hermann, Booth Harbor, and Thorburn S. Kennedy, East Booth Bay, both of Me., assignors to Castle & Cooke Techniculture, Inc., Salinas, Calif.**

**Filed Apr. 1, 1982, Ser. No. 364,578**

**Int. Cl.³ B29D *27/04***

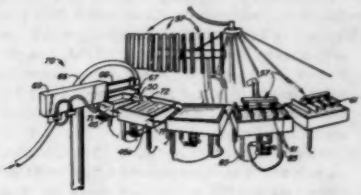
**U.S. Cl. 264—45.3** **36 Claims**

1. In the method of forming soil plugs within carrying trays comprising the steps of introducing a soil-water-resistive expandable prepolymer resin mixture into a mold receptacle onto a base mold member therein, positioning thereon a tray mold member having an array of plug-molding cavities, urging the tray and base mold members together to squeeze soil-water-reactive expandable prepolymer resin mixture therebetween into the plug-molding cavities, and clamping the tray and base mold members together while the soil-resin mixture cures, the improved method of the continuously forming highly regular and homogeneous soil plugs comprising the steps of:

continuously bringing the water-reactive expandable prepolymer resin compound into initial reactive contact with a water-containing soil slurry;

mixing said pre-polymer compound and soil slurry and continuously dispensing the resulting mixture into mold receptacles in a time span short compared with the primary reaction time of the soil slurry and the pre-polymer compound;

continuously dispensing the resulting mixtures seriatim into



said mold receptacles to form an approximately uniform layer covering the base mold members therein;

positioning a tray mold member within a receptacle upon said approximately uniform layer before the layer noticably expands; and

performing the step of urging the tray and base mold members together to squeeze the soil-water-resistive expandable prepolymer resin mixture therebetween into the plug-molding cavities before the layer noticably expands.

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**4,422,991**

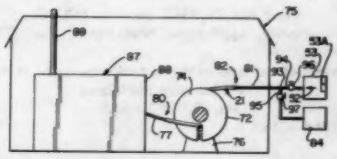
## METHOD OF MAKING HOSE CONSTRUCTION

**Alfred R. Phillips, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio**

**Filed Feb. 22, 1982, Ser. No. 350,968**

**Int. Cl.³ B29C *17/07***

**U.S. Cl. 264—83** **5 Claims**



1. In a method of making a hose construction for conveying fluids having nonpolar hydrocarbons comprising the step of providing a seamless tube of a polyolefin material and of indefinite length, and treating the inner surface of said tube with a fluorine gas to define a barrier layer having a fluorocarbon composition as an integral portion of said tube, said barrier layer rendering said tube substantially impermeable to said hydrocarbons, the improvement comprising the steps of disposing an inert treating gas inside said tube as said tube is being extruded from a mass of said material through a tube forming die means so that the inner surface of said tube is maintained oxygen free at the time of forming thereof, sealing a leading end portion of said tube to prevent loss of said treating gas, winding the treated tube to define a first supply roll thereof, cutting said tube between a pair of sealing clamps after extruding a predetermined length thereof thereby sealing both the trailing end of said tube wound on said first supply roll and a leading end of said tube to be wound on another supply roll, forcing said fluorine gas through said trailing end of said tube while in said first supply roll thereof to displace said inert treating gas and to treat said inner surface thereof while the same is still oxygen free, and, thereafter, purging said fluorine gas from said tube while still in said first supply roll thereof by forcing a purging gas through said trailing end thereof.

4,422,992

## EXTRUDER PROCESS FOR PREPARATION OF CARBON FIBER REINFORCED FLUOROPOLYMER COMPOSITIONS

Rudolph H. Michel, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Feb. 12, 1982, Ser. No. 348,365
Int. Cl.³ B29B 1/10
U.S. Cl. 264—108 2 Claims

1. A process for preparing a blend of a melt-extrudable tetrafluoroethylene copolymer and carbon fiber comprising:

(i) providing a corotating, intermeshing twin screw extruder with a screw speed of 50 to 120 RPM, a barrel temperature of 220° to 410° C., a first zone wherein the ratio of screw length to screw pitch is about 11 to 15, a second zone for metering the blend and a die slot having an opening of 2 to 4 mm;

(ii) feeding the polymer and 20 to 35 weight percent based on polymer of continuous carbon fiber into the first zone, therein melting the polymer, chopping the fibers so that a substantial fraction is from about 1.5 to 13 mm in length and blending the polymer and chopped fibers; and

(iii) transferring the polymer/fiber blend through the second zone of the extruder and out of the extruder through the die slot.

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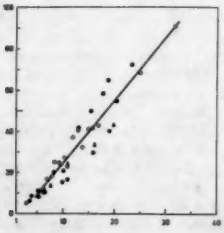
4,422,993

## PROCESS FOR THE PREPARATION OF FILAMENTS OF HIGH TENSILE STRENGTH AND MODULUS

Paul Smith, Sittard, and Pieter J. Lemstra, Brunssum, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Jun. 24, 1980, Ser. No. 162,449
Claims priority, application Netherlands, Jun. 27, 1979, 7904990
The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.
Int. Cl.³ D01D 5/12
U.S. Cl. 264—210.8 6 Claims



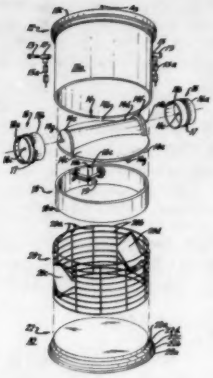
1. Process for the preparation of polyethylene filaments of high modulus and tensile strength which comprises spinning a solution having a concentration of from 1% to 20% by weight of a high-molecular-weight linear polyethylene polymer with a weight-average molecular weight of $\overline{M}_w$ of at least $8\times10^5$, and thereafter drawing the spun filaments using a draw ratio of at least $(12\times10^6/\overline{M}_w)+1$, at a drawing temperature of between 75° to 135° C. such that, at the draw ratio, concentration and temperature used, the modulus of the filaments is at least 20 GPa.

4,422,994

## METHOD AND APPARATUS FOR FORMING INVERTS IN MANHOLE ASSEMBLIES, AND THE LIKE

Jack Ditcher, Langhorne, Pa., assignor to A-Lok Products, Inc., Tullytown, Pa.

Filed Feb. 17, 1981, Ser. No. 234,639
Int. Cl.³ B28B 1/14, 7/06, 7/16
U.S. Cl. 264—219 15 Claims



1. A method for producing an invert in a manhole base member having openings for receiving conduit comprising the steps of:

locating centering means in the position occupied by the openings in said manhole base member, said centering means having centering openings;

placing an invert forming mold assembly having curved surface portions defining the invert to be provided in the manhole base member, said invert forming mold assembly having openings at the ends of said curved surface portions, said openings lying on a line substantially parallel to the longitudinal axis of the curved portion;

moving alignment members axially only through said openings and into said centering means to join and accurately align said centering means and said invert forming mold assembly; and

pouring casting material to a level sufficient to substantially cover the curved surface portions of said invert forming mold assembly for forming the invert in said manhole base member.

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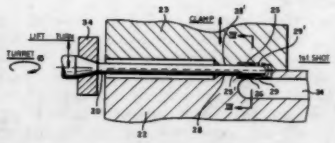
4,422,995

## METHOD AND APPARATUS FOR MOLDING HOLLOW, SLENDER WORKPIECES

Robert D. Schad, Toronto, Canada, assignor to Husky Injection Molding Systems Ltd., Bolton, Canada

Filed Dec. 7, 1981, Ser. No. 327,900
Int. Cl.³ B29C 5/00; B29D 23/08; B29F 1/022
U.S. Cl. 264—250 20 Claims



1. A method of injection-molding an elongate hollow workpiece of plastic material, comprising the steps of:

(a) introducing an elongate core, having one end fixedly

secured to a support, into a first mold portion having clamping surfaces engageable with said core and defining at least one generally annular first-shot cavity with at least one peripheral discontinuity encircling said core in the vicinity of an opposite, free end thereof upon closure of said clamping surfaces around said core;

(b) upon engagement of said core by said clamping surfaces, injecting plastic material into said first-shot cavity to form a generally annular spacer with at least one peripheral recess corresponding to said discontinuity;

(c) upon disengagement of said clamping surfaces from said core and hardening of said spacer, introducing said core into a second mold portion with a second-shot cavity, of greater length than said first-hot cavity, longitudinally divided by said spacer into one section surrounding said free end and another section communicating with said one section via said peripheral recess;

(d) injecting plastic material into said one section and thence via said peripheral recess into the remainder of said second-shot cavity;

(e) allowing the plastic material last injected to harden around said core into a finished workpiece incorporating said spacer; and

(f) stripping said finished workpiece from said core.

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**4,422,996**

## METHOD FOR MAKING COATED MOLDED ARTICLES

**Robert F. Navin, and James R. Prom, both of Port Washington, Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.**

**Continuation of Ser. No. 145,800, May 1, 1980, abandoned. This application Jan. 11, 1982, Ser. No. 338,272**

**Int. Cl.³ B29G 7/00**

**U.S. Cl. 264—255** **6 Claims**

1. A method for producing a coated, molded, fiber-reinforced thermoset plastic article comprising

producing a fiber-reinforced, thermoset plastic article in a matched metal mold;

opening the said mold after the article has attained its intended shape;

introducing into the open mold a single-component composition consisting essentially of:

A. an alpha, beta ethylenically unsaturated monomer solution of a polyurethane polyacrylate which is the reaction product, substantially free of unreacted—NCO radicals of

(1) an organic diisocyanate;

(2) a hydroxy alkyl acrylate or methacrylate;

(3) an organic diol, selected from the class consisting of alkylene diols, alkylene diol esters and polyesters; alkylene diol ethers and polyethers;

B. a copolymerizable alpha-, beta-ethylenically unsaturated monomer solution of an acrylic or methacrylic ester of a diepoxide;

C. an initiator for addition polymerization;

D. fillers;

closing the mold and thereby spreading the said composition over at least one surface of the said article; retaining the mold in the closed condition at a molding temperature sufficient to cause said article to cure further and cause said composition to cure by addition polymerization;

opening the mold and recovering a molded, fiber-reinforced thermoset plastic article having an adherent coating over at least one surface thereof.

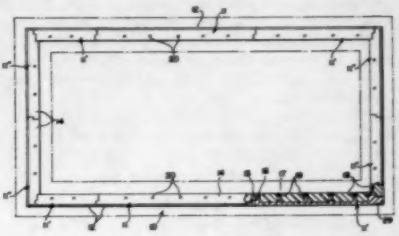
**4,422,997**

## METHOD FOR MAKING AN INSULATED PANEL

**Alfred Machaik, 6386 Curtis Rd., Plymouth, Mich. 48170**

**Continuation of Ser. No. 969,484, Dec. 14, 1978, abandoned. This application Feb. 17, 1981, Ser. No. 234,886**

**Int. Cl.³ B28B 1/50, 1/30**

**U.S. Cl. 264—261** **3 Claims**

1. A process for making a building module 110 comprising,

providing a frame having sides, ends and an open top,

forming an enclosure having inside dimensions equal to the dimensions of said module to be formed comprising,

placing said frame on a relatively horizontal flat surface,

placing blocks of insulation material in said frame spaced from each other a sufficient distance to provide spaces for concrete to form webs and spaced inwardly from the edges of said frame to receive concrete, forming sides,

placing furring strips in said frame in the spaces between said insulation blocks and resting on the flat surface forming the bottom of said frame,

the furring strips resting on said flat surface,

said furring strips having nails driven from the side opposite said flat surface therein, said nails being crossed forming a cradle to receive reinforcing rods, supporting the reinforcing rods in said cradle spaced at a distance from said furring strips and pouring concrete into the space between said frame and around said reinforcing rods and around said nails and between said insulation blocks and said frame whereby an insulation panel is formed with concrete between and around said insulation material.

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**4,422,998**

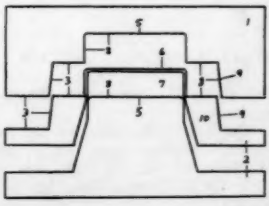
## CONTROLLED EJECTION METHOD FOR INJECTION MOLDING

**Jens O. Sorensen, P.O. Box 2274, Rancho Santa Fe, Calif. 92067**

**Filed Apr. 22, 1982, Ser. No. 370,937**

**Int. Cl.³ B29C 7/00**

**U.S. Cl. 264—335** **6 Claims**



1. A method of cyclic injection molding of plastic where the mold comprises two parts which are separated by a parting surface and at least one cavity situated internally to the boundaries of the parting surface, and wherein each production cycle comprises the steps of:

(a) Combining the two mold parts by moving, in a predetermined direction, the mold parts in relation to each other;
(b) Injecting plastic in a fluid state into a cavity situated within the parting surface;
(c) Solidifying the injected plastic in the cavity, thereby creating a plastic product;
(d) Separating the two mold parts by moving, in a direction opposite to the predetermined direction, said mold parts in relation to each other to create a substantially enclosed guide conduit having contours defined by the regions of the parting surface and the internally positional cavity/ies that are exposed subsequent to separation and leading in a direction substantially perpendicular to said predetermined direction;
(e) Ejecting the plastic product into said guide conduit; and
(f) Guiding and transporting the ejected product from between the mold parts through the guide conduit.

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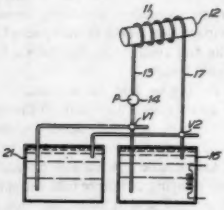
**4,422,999**

## THERMOFORMING TUBULAR ARTICLES

**Peter R. Mitchell, The Cottage, London Rd., Kingsworth, Winchester, Hampshire S023 7QN, England**

**PCT No. PCT/GB80/00080, § 371 Date Dec. 31, 1981, § 102(e) Date Dec. 31, 1981, PCT Pub. No. WO81/03145, PCT Pub. Date Nov. 12, 1981**
**PCT Filed May 7, 1980, Ser. No. 336,342**
**Int. Cl.³ B29C *17/02***
**U.S. Cl. 264—339** **2 Claims**



1. A method of manufacturing an open ended tubular article of predetermined shape or form from a tube of heat mouldable plastics material comprising preheating a tube to a forming temperature at which it can be bent to a predetermined shape by passing a heated fluid therethrough, bending the tube to the predetermined shape, heating the tube above the temperature at which it is bent to the annealing temperature of the material by passing heated fluid therethrough in direct contact with the interior of the tube, maintaining the flow of heated fluid for a period of time sufficient to anneal the tube and cooling the tube while constrained in the predetermined shape by passing a cooling fluid therethrough, the heating and cooling fluids comprising the same substance.

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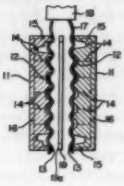
**4,423,000**

## METHOD FOR MOLDING HOLLOW PLASTIC ARTICLES

**Syoichi Terasoka, 3767-2, Kamura-cho, Fukuyama-shi, Hiroshima-Ken, Japan**

**Filed Jul. 13, 1981, Ser. No. 282,704**
**Claims priority, application Japan, Oct. 17, 1980, 55-145964; Mar. 20, 1981, 56-40995; Mar. 25, 1981, 56-44344**
**Int. Cl.³ B29C *17/04, 17/07***
**U.S. Cl. 264—524** **6 Claims**

1. A method for producing a hollow synthetic resin molded article, which comprises
opening a split mold having mold cavities with a contour conforming to the configuration of the desired article,
feeding a heated parison of a thermoplastic synthetic resin in the form of a tube or two parallel-laid sheets extruded from a die into a space between the opposing mold members of the split mold,
applying negative pressure to vacuum suction holes provided in the cavities of said split mold and the vacuum suction holes provided in parting surfaces surrounding said cavities, the positions of said latter vacuum suction holes relative to said cavities being determined according to the depth of said cavities,
simultaneously blowing heated compressed air against the



inside surface of that portion of the parison which correponds to said parting surfaces in the direction facing said parting surfaces to facilitate attaching of the parison to said parting surfaces,
closing said split mold, while applying said negative pressure, to form the parison into a crude hollow molded article,
blowing pressurized air into the hollow portion of said crude molded article with said split mold being kept closed to thereby form the parison into a desired final configuration.

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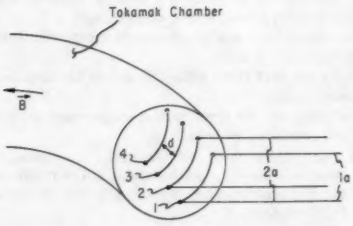
**4,423,001**

## SYSTEM AND METHOD FOR GENERATING CURRENT BY SELECTIVE MINORITY SPECIES HEATING

**Nathaniel J. Fisch, Princeton, N.J., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Feb. 9, 1981, Ser. No. 233,297**
**Int. Cl.³ G21B *1/00***
**U.S. Cl. 376—123** **12 Claims**




1. A system for generating steady-state toroidal current in a toroidal plasma comprising:
means for immersing the toroidal plasma in a steady-state toroidal magnetic field, and
means for preparing said plasma with at least one minority ion species which has a different ion charge state than does the majority ion species and which also has a different charge to mass ratio than does the majority ion species, and
means for injecting rf energy into said toroidal plasma such that the rf energy comprises a spectrum of waves traveling substantially in one toroidal direction,
where said rf energy is of predetermined frequency and is phased in a predetermined manner such as to increase preferentially the cyclotron motion of minority species ions traveling in a selected toroidal direction, thereby heating the minority species ion so as to yield a velocity of the heated minority species ions parallel to the selected

toroidal direction, $v_{\parallel}$, which is approximately equal to $v_{te}(m_i/m_e)^{\frac{1}{2}}[(\frac{1}{2})(2/\pi)^{\frac{1}{2}}((m\alpha/m_i)/(1+m\alpha/m_i))]^{\frac{1}{2}}$, where $v_{te}$ is the electron thermal velocity, and where $m\alpha, m_i, m_e$ denote the masses of, respectively, the minority ion species, the majority ion species, and the electron species.

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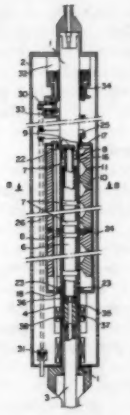
**4,423,002**

## APPARATUS FOR CONTROLLING A NUCLEAR REACTOR BY VERTICAL DISPLACEMENT OF A UNIT ABSORBING NEUTRONS

**Albert Wiart, Sannois; Jacques Defaucheux, Jeumont; Gilbert Pasqualini, Maubeuge, and Jean Martin, Chatillon, all of France, assignors to Framatome, Courbevoie, France**

**Filed Dec. 8, 1980, Ser. No. 214,291**
**Int. Cl.³ G21C 7/12**
**U.S. Cl. 376—227** **5 Claims**



1. Apparatus for controlling a nuclear reactor by vertical displacement of a unit absorbing the neutrons inside the core of the reactor and dropping of the absorbent unit into maximum insertion position under the action of its own weight for emergency shutdown, said absorbent unit being fixed to the lower end of a vertical control shaft (3), said vertical control shaft displaceable into a cylindrical sealed enclosure (1), said enclosure having a vertical axis, and the interior of said enclosure communicating with the interior of said reactor, said apparatus comprising:

(a) a generally cylindrical piece (6) coaxial with and inside said enclosure (1), said piece being made of magnetic material, vertically movable in said enclosure, guided in its displacements and connected to the upper end of said vertical control shaft (3), said cylindrical piece also having a plurality of successive annular projections arranged along the axial direction of the cylindrical piece, said annular projections being of smaller diameter than the internal diameter of said enclosure;

(b) at least one inductor (10) disposed outside of the said enclosure (1), comprising at least two pole shoes (16) axially separated by a distance equal to the space between said successive annular projections, said pole shoes (16) being at a radial distance from the enclosure which allows magnetic coupling between said inductor and said cylindrical piece;

(c) vertically movable mechanical means (22, 23, 24, 26, 27, 28) for accurate guidance and displacement of said inductor (10) in the vertical direction with predetermined stops, said displacements producing a corresponding displacement of said cylindrical piece (6);

(d) electromagnetic control means located outside said enclosure for detachably connecting said cylindrical piece to said vertical control shaft, said magnetic control adapted to release said control shaft and said absorbent unit when electric current to the electromagnet is cut off.

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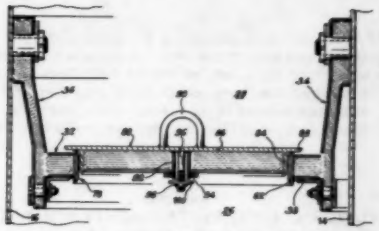
**4,423,003**

## THERMAL INSULATION DEVICE

**Guy Lemercier, 67, Avenue de la Bourgade, 13610 Le Puy Ste Reparade, France**

**Filed Sep. 18, 1981, Ser. No. 303,471**
**Claims priority, application France, Sep. 30, 1980, 80 20917**
**Int. Cl.³ G21C 15/12**
**U.S. Cl. 376—290** **9 Claims**



1. A thermal insulation device for insulating the upper area of the annular space separating the main vessel and safety vessel of a fast neutron neuclear reactor, said two vessels having a common vertical axis and are sealed in their upper part by a horizontal slab which is also responsible for the suspension of the two vessels, wherein the said device comprises a lower thermal insulation ring having a generally annular shape defining an inner peripheral edge spaced from the main vessel and fixed to the lower end of an inner thermal insulation baffle whose upper end is fixed to the main vessel, and an outer peripheral edge spaced from the safety vessel and fixed to the lower end of an outer thermal insulation baffle whose upper end is fixed to the safety vessel, each of the thermal insulation baffles being deformable so as to compensate any differential expansion or deformation of the vessels.

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**4,423,004**

## TREATMENT OF TANTALUM POWDER

**Sidney D. Ross, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.**

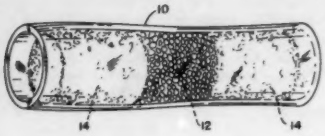
**Filed Mar. 24, 1983, Ser. No. 478,384**
**Int. Cl.³ B22F 1/00, 1/02**
**U.S. Cl. 419—35** **4 Claims**

1. A process for treating tantalum powder for electrolytic capacitors comprising contacting the powder after a thermal treatment in the absence of oxygen step at 700° C. and above and before exposure to an oxygen-containing fluid with a nonaqueous solution of ammonium thiocyanate in an amide solvent to passivate said powder to oxygen pickup on exposure to said oxygen-containing fluid.

## 4,423,005
## DETERMINING QUANTITATIVE DEGREE OF ETHYLENE OXIDE EXPOSURE IN STERILIZATION PROCESSES

J. Barry Murtaugh, Barrington; Dean G. Laurin, Lake Zurich, both of Ill.; John E. Kling, Dallas, Tex., and Archie G. Woodworth, Barrington, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 305,418, Sep. 25, 1981, Pat. No. 4,348,209.
This application Apr. 9, 1982, Ser. No. 366,945
Int. Cl.³ G01N *31/00, 31/10*
U.S. Cl. 422—61 6 Claims




1. A device for quantitatively determining the amount of exposure of an object to ethylene oxide gas, which comprises:
a tube containing a catalyst for the hydrolysis of ethylene oxide, said tube being sealed at both ends thereof, the seal at at least one end being gas-permeable, but impermeable to said catalyst and liquid hydrolysis products of ethylene oxide.

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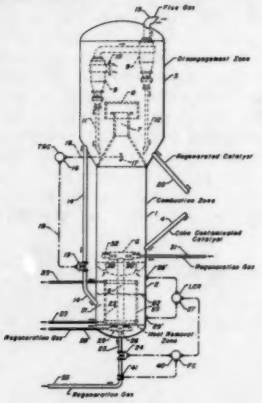
## 4,423,006
## FLUID CATALYST REGENERATION APPARATUS

Anthony G. Vickers, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 265,502, May 20, 1981, Pat. No. 4,371,453.
This application Sep. 24, 1982, Ser. No. 423,373
Int. Cl.³ F27B *15/08;* B01J *21/20, 29/38;* C10G *11/18*
U.S. Cl. 422—109 3 Claims



1. An apparatus for regenerating a coke-contaminated, fluid catalyst, which apparatus comprises in combination:
(a) a vertically-oriented combustion chamber having means by which said coke-contaminated fluid catalyst may be introduced therein and contacted with regeneration gas;
(b) a disengagement chamber located superadjacent to and above said combustion chamber and in communication therewith;
(c) a heat removal chamber located superadjacent to and below said combustion chamber in which may be maintained a dense-phase fluid catalyst bed;
(d) heat removal means comprising substantially vertically orientated conduits containing heat absorbing material positioned within said heat removal chamber so as to enable immersion of said heat removal means in said dense-phase fluid catalyst bed, said conduits being sealed with respect to the interior of said heat removal chamber such that said heat-absorbing material is in indirect heat exchanging contact with the interior of said heat removal chamber;
(e) a catalyst recycle conduit connecting said disengagement chamber with said heat removal chamber, such that hot regenerated fluid catalyst can pass from said disengagement chamber to said heat removal chamber;
(f) a cooled catalyst transfer conduit of vertical orientation connecting the lower portion of said heat removal chamber with the lower portion of said combination chamber, such that fluid catalyst can pass from said dense-phase fluid catalyst bed in said heat removal chamber to said combustion chamber;
(g) a regeneration gas inlet line connecting with a lower portion of said cooled catalyst transfer conduit for introducing at least a portion of said regeneration gas into said lower portion of said cooled catalyst inlet conduit below the level of said dense-phase fluid catalyst bed, thereby effecting the flow of cooled fluid catalyst from said dense-phase fluid catalyst bed in said heat removal chamber to said combustion chamber; and
(h) a control system for maintaining the extent of immersion of said heat removal means in said dense-phase fluid catalyst bed by selectively adjustably maintaining the level of said dense-phase fluid catalyst bed in said heat removal zone comprising means to sense said level of said dense-phase fluid catalyst bed in said heat removal chamber, level control means having an adjustable set point and developing a level output signal, flow control means regulating the rate of flow of said regeneration gas into said cooled catalyst transfer conduit, and means for transmitting said level output signal to said flow control means, wherein said regeneration gas passed through said cooled catalyst transfer conduit is adjusted responsive to said desired level, to maintain said desired level of said dense-phase fluidizing bed and thereby said extent of immersion of said substantially vertically oriented conduits containing said heat absorbing material in said heat removal chamber in accordance with said desired set point.

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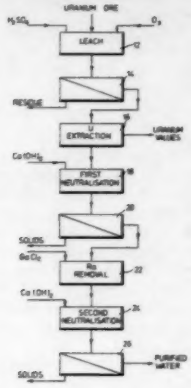
## 4,423,007
## REMOVAL OF RADIUM FROM AQUEOUS SULPHATE SOLUTIONS

Donald R. Weir; Ian M. Masters, both of Fort Saskatchewan, and Manfred Neven, Saskatoon, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Jul. 13, 1981, Ser. No. 283,318
Claims priority, application Canada, Aug. 22, 1980, 358965
Int. Cl.³ C01F *13/00*
U.S. Cl. 423—2 8 Claims

1. A process for removing radium from a radium-containing aqueous sulphate solution also containing dissolved magnesium at a pH not greater than about 10, comprising treating the solution with a soluble barium salt to precipitate radium as barium radium sulphate, raising the pH of the solution to at

least about 11 to precipitate an insoluble magnesium compound which collects the barium radium sulphate precipitate, and




separating substantially all of the precipitates from the solution.

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**4,423,008**

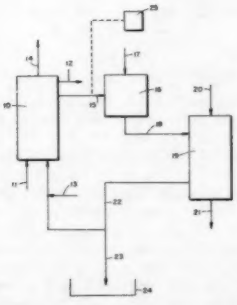
## DIRECT ACID ELUTION OF ANIONIC EXCHANGE RESINS FOR RECOVERY OF URANIUM

**Tsoung-Yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 80,627, Oct. 1, 1979, abandoned, and Ser. No. 327,543, Dec. 4, 1981, abandoned, which is a continuation of Ser. No. 80,627, Oct. 1, 1979, abandoned. This application Feb. 25, 1982, Ser. No. 352,288**

**Int. Cl.³ C01G *43/01***

**U.S. Cl. 423—7** **12 Claims**



1. A method for recovering uranium values from a carbonate leach solution comprising:

flowing said carbonate leach solution containing said uranium values through a column of a basic, anionic exchange resin to exchange said uranium values onto said resin;

ceasing the flow of said carbonate leach solution when said column of said resin is sufficiently loaded with said uranium values;

directly eluting said column of said resin without pretreatment of said resin by flowing a concentrated acidic eluant through said column of said resin to exchange said uranium values from said resin, said eluant comprising hydrochloric acid and further comprising sodium chloride in a concentration of less than 1.5 normal;

ceasing the flow of said concentrated acidic eluant when said uranium values have been exchanged from said column of resin; and

again flowing said carbonate leach solution containing said uranium values through said column of said resin to exchange said uranium values onto said resin without treatment of said resin after said eluting.

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**4,423,009**

## CARBONATE, SULPHATE AND HYDROXIDE OR HYDROGEN CARBONATE

**Pierre Maurel, and Francois Nicolas, both of Aix-en-Provence, France, assignors to Aluminium Pechiney, Lyons, France**

**Filed Mar. 23, 1981, Ser. No. 246,398**

**Claims priority, application France, Apr. 2, 1980, 80 07878**

**Int. Cl.³ C01G *56/00, 31/00, 39/00***

**U.S. Cl. 423—15** **13 Claims**

1. A process for the treatment of aqueous solutions containing alkali metal carbonate, sulfate, and hydroxide or hydrogen carbonate, at least one metal selected from the group consisting of vanadium, uranium and molybdenum, in the form of alkali metal salts, and inorganic and/or organic impurities, which comprises adding lime to the solution for reaction at a temperature below the boiling point temperature of the solution to precipitate insoluble calcium salts as a first precipitate and to form an alkali metal hydroxide-enriched liquor, separating said precipitate from the alkali metal hydroxide-enriched liquor, concentrating said liquor to provide a solution wherein the alkali metal hydroxide is present in an amount up to 50% by weight of the solution to form a second precipitate containing alkali metal sulfate and the alkali metal hydroxide-enriched liquor, separating the second precipitate from the alkali metal hydroxide-enriched liquor, and recovering the hydroxide-enriched liquor, dissolving the alkali metal sulfate precipitate in an aqueous medium and treating the solution first with barium aluminate and then with carbon dioxide, separating the resulting precipitate and the corresponding liquor which essentially contains carbonate ions, and heating the resulting precipitate to regenerate the barium aluminate for reuse.

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**4,423,010**

## PROCESS FOR THE SELECTIVE REMOVAL OF ARSENIC IN THE COURSE OF THE OXIDIZING ATTACK BY MEANS OF A CARBONATED LIQUOR ON A URANIFEROUS ORE CONTAINING SAME

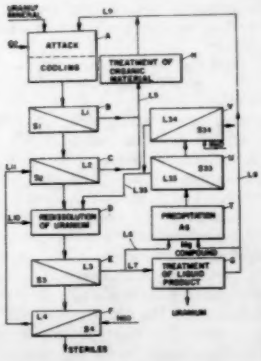
**Pierre Maurel, Aix-en-Provence, France, assignor to Aluminium Pechiney, Lyons, France**

**Filed Jul. 19, 1982, Ser. No. 399,699**

**Claims priority, application France, Jul. 29, 1981, 81 15065**

**Int. Cl.³ C22B *60/02, 30/04***

**U.S. Cl. 423—15** **6 Claims**




1. In a process for the selective removal of arsenical materi-

als, in the course of a continuous hot oxidizing attack process, comprising attacking a uraniferous ore containing arsenical materials as impurities in the presence of an oxidizing agent in the reaction medium by means of an aqueous liquor formed by a recycling solution containing alkali metal carbonate and bicarbonate, and uranium close to the limit of solubility thereof, under concentration, temperature and pressure conditions which cause solubilization of the uranium and arsenic present in the ore, and re-precipitation of uranium values in the attack medium, collecting a suspension of a solid phase in a liquid phase, cooling the suspension, separating the solid phase from the liquid phase, recycling the liquid phase to the attack operation, and treating the separated solid phase by means of an aqueous liquor to re-dissolve the precipitated uranium, the improvement comprising introducing a magnesium compound into one of the solutions containing arsenic in an amount which is at least equal to the stoichiometric amount required to cause precipitation of magnesium arsenate.

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4,423,011

## SELECTIVE RECOVERY OF BASE METALS AND PRECIOUS METALS FROM ORES

**Elizabeth G. Baglin, and John M. Gomes, both of Reno, Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.**

Filed Oct. 20, 1982, Ser. No. 435,535
Int. Cl.[3] C01G *55/00, 3/10, 53/10, 7/00*
U.S. Cl. 423—22 7 Claims

1. A process for recovery of nickel, iron, copper, platinum, palladium and gold values from ore concentrates consisting essentially of:

(a) smelting the concentrate with a flux to form a matte and slag,

(b) grinding the matte to a particle size suitable for leaching,

(c) leaching, in a first-stage leach, the ground matte with sulfuric acid of a concentration of about 10 to 40 wt-pct at a temperature of about 40° to 100° C. and atmospheric pressure to selectively extract nickel and iron values, and

(d) leaching, in a second-stage leach, the residue from the first stage leach with a leach solution comprising an acidic aqueous solution of a ferric or cupric salt, said solution having a pH of less than about 1.5, at a temperature of about 50° to 100° C. and atmospheric pressure, to selectively extract copper values and provide a residue containing a high concentration of platinum, palladium and gold.

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4,423,012

## MANGANESE AND ZINC SOLVENT EXTRACTION PROCESS

**James E. Reynolds, Golden, and Nicholas J. Lombardo, Boulder, both of Colo., assignors to Hazen Research Incorporated, Golden, Colo.**

Filed Dec. 31, 1981, Ser. No. 336,502
Int. Cl.[3] C01G *9/00, 45/00*
U.S. Cl. 423—49 27 Claims

1. In a process for recovering a desired component selected from the group consisting of manganese and zinc by electrowinning the desired component from an aqueous solution containing impurities selected from the group consisting of magnesium when said desired component is zinc and potassium, when said desired component is manganese, the improvement comprising substantially reducing the amount of at least one of the aforesaid impurities in the electrowinning feed solution and substantially increasing the amount of metal ions of the desired component therein by:

a. mixing an aqueous bleed stream from said electrowinning feed solution with a solvent extraction agent comprising diethylhexylphosporic acid as an organic extraction agent and an organic solvent therefore to form mixture having a pH of from about 1 to about 5 and an organic to aqueous ratio of from about 0.5 to about 4 to selectively extract desired metal ions;

b. separating the aqueous and organic portions of the mixture of step (a);

c. stripping the loaded organic extractant of step (b) with a dilute acidic solution;

d. recycling the loaded strip solution of step (c) to said electrowinning process.

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4,423,013

## PROCESS FOR THE PURIFICATION OF SOLUTIONS CONTAINING ALKALI METAL CARBONATE, SULPHATE, HYDROXIDE OR POSSIBLY HYDROGEN CARBONATE, AND ONE AT LEAST OF THE METALS VANADIUM, URANIUM AND MOLYBDENUM

**Pierre Maurel, and Francois Nicolas, both of Aix-en-Provence, France, assignors to Aluminium Pechiney, Lyons, France**

Filed Mar. 23, 1981, Ser. No. 246,405
Claims priority, application France, Apr. 2, 1980, 80 07877
Int. Cl.[3] C01G *39/00, 56/00;* C11G *31/00*
U.S. Cl. 423—55 7 Claims

1. A process for extracting molybdenum from aqueous solutions to be purified which contain alkali metal carbonate, sulphate, hydroxide or hydrogen carbonate and at least one other of the metals selected from the group consisting of vanadium and uranium, in the form of alkali metal salts, and mineral and/or organic impurities comprising treating the solution with lime at a temperature below the boiling point of the solution to precipitate insoluble calcium salts as a first precipitate, separating the first precipitate from the remaining alkali metal hydroxide-enriched liquor, concentrating the remaining liquor to provide a solution wherein the alkali metal hydroxide is present in an amount up to 50% by weight to produce a second precipitate containing a mixture of alkali metal molybdate and sulphate, separating the second precipitate from the liquor, dissolving the second precipitate in an aqueous liquor including sulphide ions and then acidifying the liquor to quantitatively precipitate molybdenum sulphide, separating the precipitated molybdenum sulphide from the remaining liquor which essentially contains alkali metal sulphate and separating the molybdenum sulphide from the remaining liquor.

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4,423,014

## SOLVENT EXTRACTION

**Alkis S. Rappas, Chagrin Falls, Ohio, and Lloyd R. Allen, Belmont, Mass., assignors to Cabot Corporation, Kokomo, Ind.**

Filed Jan. 21, 1981, Ser. No. 226,977
Int. Cl.[3] C22B *23/04;* C01G *51/00*
U.S. Cl. 423—139 2 Claims

1. In a process for separating cobalt from a pregnant liquor, which process includes the steps of: mixing said pregnant liquor with an organic mixture comprised of an organic amine and a diluent, said organic mixture being substantially insoluble in said pregnant liquor, said organic mixture absorbing said metallic value from said pregnant liquor; separating said organic mixture from said liquor; and stripping said metallic value from said organic mixture; the improvement comprising the steps of mixing said pregnant liquor with an organic amine and iso-butyl-heptyl ketone, said organic mixture having at least 10%, by volume, of iso-butyl-heptyl ketone.

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4,423,015

## PROCESS OF PRODUCING DEFLUORINATED PRODUCT FROM LOW BPL PHOSPHATE ROCK

**John W. Roy, Jr., Gainesville; Melvin J. Arbie, Live Oak, and Joel P. Holmes, Lake City, all of Fla., assignors to Occidental Chemical Company, Los Angeles, Calif.**

Filed Feb. 4, 1982, Ser. No. 345,949
Int. Cl.[3] C01F *1/00, 5/00, 11/00*
U.S. Cl. 423—167 6 Claims

1. In a process for producing a defluorinated, calcined product having a weight ratio P to F greater than 50 to 1 and

containing calcium, sodium and phosphorus, by calcination of a mixture comprising phosphate rock, containing phosphorus, calcium and fluorine and having a bone phosphate of lime analysis of from about 71 to about 77, with caustic soda, phosphoric acid and water, said mixture having a weight ratio P to F less than 50 to 1 wherein said mixture is mixed in a first stage then granulated in a second step, to produce a granulated mixture, and said granulated mixture is calcined and said calcination being conducted at a temperature of at least about 1900° F. and at conditions which produce said defluorinated, calcined product, the improvement wherein the amount of phosphoric acid in the mixture is such that the ratio of phosphorus in percentage by weight on a dry basis in said mixture-to-the phosphorus desired in percentage by weight in the defluorinated, calcined product is substantially equivalent to the ratio of the calcium in percentage by weight on a dry basis in the mixture-to-the calcium in percentage by weight in the defluorinated, calcined product, and wherein the desired percent by weight of phosphorus in the defluorinated, calcined product is from about 17% to about 18.9%.

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4,423,016

## PROCESS FOR THE PRODUCTION OF DRY FLUE GAS GYPSUM

**Franz Wirsching, In den Weinbergen 7; Rolf Hüller, Neubergstrasse 37, both of 8715 Iphofen, and Bärbel Limmer, Virchowstr. 39, 8500 Nürnberg, all of Fed. Rep. of Germany**

**Filed Mar. 1, 1982, Ser. No. 353,738**

**Claims priority, application Fed. Rep. of Germany, Mar. 3, 1981, 3107951**

**Int. Cl.³ C01F *1/00, 5/12;* C22B *26/20;* C01B *17/00***

**U.S. Cl. 423—170** **14 Claims**

1. In a process for the production of flue gas gypsum dihydrate from a furnace installation wherein a main flue gas stream is passed to a drying stage to dry gypsum dihydrate containing free water, by transferring flue gas stream heat thereto, passing the cooled flue gas stream containing gypsum dihydrate to a desulfuration stage and producing and separating gypsum dihydrate containing free water in the desulfuration, and passing the separated gypsum dihydrate containing free water to the drying stage to be dried therein, the improvement comprising the steps of:

dedusting the main flue gas stream obtained from the furnace installation;

separating a partial flue gas stream from the main flue gas stream in an amount of about 1–10% of the main flue gas stream; feeding a resultant stream of 90–99% of the main flue gas stream to a desulfuration stage for forming flue gas gypsum dihydrate containing free water, and separating flue gas gypsum dihydrate containing free water from the flue gas in the desulfuration stage; and

simultaneously feeding the formed flue gas gypsum dihydrate containing free water from said desulfuration stage, and said partial flue gas stream to a drying stage to contact the flue gas gypsum dihydrate containing free water with the partial flue gas stream for drying the flue gas gypsum dihydrate under temperature and time conditions to form dried flue gas gypsum dihydrate consisting essentially of calcium sulfate dihydrate substantially free of hemihydrate and anhydrous calcium sulfate, and removing dried flue gas gypsum dihydrate having a particle size greater than about 20 micron from the drying stage, and recycling dry flue gas gypsum dihydrate having a particle size of less than about 20 micron along with the main flue gas stream and the partial cooled flue gas stream to the desulfuration stage.

4,423,017

## PROCESS FOR REDUCING NO EMISSIONS

**Anthony M. Dean, Westfield, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.**

**Filed Oct. 29, 1981, Ser. No. 316,143**

**Int. Cl.³ C01B *21/00;* B01J *8/00***

**U.S. Cl. 423—235** **6 Claims**

1. In a non-catalytic combustion process wherein a reducing gas comprising ammonia, either alone or in combination with one or more additional reducing gases, is injected into a flowing combustion effluent containing NO and oxygen when at least a portion of said combustion effluent is in a reduction zone at a temperature within the range of about 850° C. to about 1100° C. to reduce the NO concentration therein, the improvement which comprises placing a metallic material selected from the group consisting of heat resistant iron-based alloys, nickel-based alloys, cobalt-based alloys, and oxide dispersion strengthened alloys substantially at the end of the reduction zone, said metallic material having a surface area greater than about $0.5\times10^{-2}m^2$ per $Nm^3/H$ of the combustion gas effluent flow within a gas residence time zone of less than one second from the ammonia source, thereby substantially reducing ammonia breakthrough without substantially producing additional amounts of NO.

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4,423,018

## BUFFERED FLUE GAS SCRUBBING SYSTEM USING ADIPIC ACID BY-PRODUCT STREAM

**J. Harvey Lester, Jr., and Donald E. Danly, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.**

**Filed Jun. 23, 1982, Ser. No. 391,083**

**Int. Cl.³ C01B *17/00***

**U.S. Cl. 423—243** **7 Claims**

1. In a method for the removal of sulfur dioxide from waste combustion gases which comprises bringing the gases into interfacial contact with an aqueous solution or slurry of limestone or lime buffered by a compound or compounds which significantly increase the dissolution of limestone or lime, the improvement comprising employing as the buffer a byproduct stream which is the byproduct of the process comprising:

(1) oxidizing cyclohexane to cyclohexanol and cyclohexanone;

(2) oxidizing the cyclohexanol and cyclohexanone with a strong oxidizing acid into a product stream comprising adipic acid with minor amounts of glutaric and succinic acids;

(3) crystallizing adipic acid from the product stream in one or more stages leaving said byproduct stream comprising glutaric acid, succinic acid, residual amounts of adipic acid and water, and the strong oxidizing acid.

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4,423,019

## PROCESS FOR REMOVING SULFUR OXIDES FROM A GAS

**Ralph J. Bertolacini, Naperville; Eugene H. Hirschberg, Park Forest, and Frank S. Modica, Downers Grove, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Division of Ser. No. 29,264, Apr. 11, 1979. This application Jul. 31, 1981, Ser. No. 288,995**

**Int. Cl.³ B01J *8/00;* C01B *17/00;* C10G *11/02***

**U.S. Cl. 423—244** **23 Claims**

1. A process for removing sulfur oxides from a gas which comprises:

(a) absorbing sulfur oxides from the gas with an absorbent which comprises a physical mixture of:

(i) a particulate cracking catalyst comprising from about 0.5 to about 50 weight percent of a crystalline aluminosilicate zeolite which is distributed throughout a porous matrix wherein said matrix comprises from about 70 to about 100 weight percent of alumina and

(ii) a particulate solid other than cracking catalyst which comprises at least one inorganic oxide selected from the

group consisting of the oxides of aluminum and magnesium in association with at least one free or combined rare earth metal selected from the group consisting of lanthanum, cerium, praseodymium, samarium and dysprosium, wherein the ratio by weight of inorganic oxide or oxides to rare earth metal or metals is from about 1.0 to about 1,000 and

(b) removing said absorbed sulfur oxides from the absorbent as a sulfur-containing gas which comprises hydrogen sulfide by contacting said absorbent with a hydrocarbon at a temperature in the range from about 375° to about 900° C.

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**4,423,020**

## CRYSTALLINE METAL SILICATE COMPOSITIONS

**James A. Hinnenkamp, and Vernon V. Walatka, Jr., both of Hamilton, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.**

**Continuation of Ser. No. 92,127, Nov. 7, 1979, Pat. No. 4,331,641. This application Oct. 15, 1981, Ser. No. 311,724**

**The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.**

**Int. Cl.³ C01B** *33/20, 35/10*

**U.S. Cl. 423—277** **6 Claims**

1. A crystalline metal silicate which is substantially free of aluminum having a composition in terms of mole ratios as follows:

$0.8\pm0.4M_{2/n}O:W_2O_3$:5 to 500 $SiO_2$:O to 100 $H_2O$ where M is a cation, n is the valence of said cation and $W_2O_3$ is a metal oxide, said metal silicate having the X-ray diffraction pattern set forth in Table 1 of the specification prepared by the method which comprises preparing a reaction mixture which is substantially free of aluminum ions and which contains tetraalkylammonium compound, sodium hydroxide, an oxide of the desired metal, an oxide of silicon, water and an aluminum chelating agent effective to provide a catalytically active crystalline metal silicate, maintaining the mixture at an elevated temperature until crystals said metal silicate are formed and separating and recovering said crystals, and in terms of mole ratios falling within the following ranges, the reaction mixture contains:

| | |
|---|---|
| $OH^-/SiO_2$ | .05–3 |
| $R_4N^+/(R_4N^+ + Na^+)$ | 0.1–1 |
| $H_2O/OH^-$ | 10–500 |
| $SiO_2/W_2O_3$ | 5–500 |
| $SiO_2$/Chelating agent | 1–1000 |

where R is propyl.

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**4,423,021**

## METHOD OF PREPARING SILICO-CRYSTAL ZSM-48

**Louis D. Rollmann, Princeton, N.J., and Ernest W. Valyocsik, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.**

**Continuation of Ser. No. 64,703, Aug. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 13,640, Feb. 21, 1979, abandoned. This application Nov. 18, 1980, Ser. No. 207,897**

**Int. Cl.³ C01B** *33/20, 33/32*

**U.S. Cl. 423—333** **2 Claims**

1. A method for preparing a porous silico-crystal characterized by an x-ray diffraction pattern whose values are set forth in Table 1 of the specification which comprises preparing a substantially alumina-free reaction mixture containing a source of a silica, an alkali metal oxide, RN, water and having a composition in terms of mole ratios of oxides, falling within the following ranges:

$Al_2O_3/SiO_2=0$

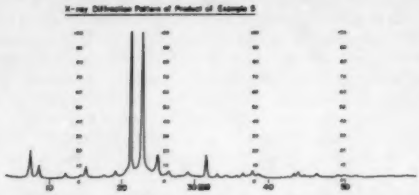
$Na/SiO_2=0$ to 2.0

$OH^-/SiO_2=0$ to 0.1

$H^+$(added)$/SiO_2=0$ to 0.2

$H_2O/SiO_2=10$ to 100

$RN/SiO_2=0.01$ to 2.0




wherein RN is an organic diamine of the formula $NH_2—C_nH_{2n}—NH_2$ and wherein n=4 to 12 and maintaining said mixture at crystallization temperature until crystals of said silico-crystal are formed.

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**4,423,022**

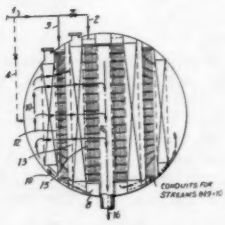
## PROCESSES FOR CARRYING OUT CATALYTIC EXOTHERMIC AND ENDOTHERMIC HIGH-PRESSURE GAS REACTIONS

**John V. Albano, Oradell, and George Friedman, Clark, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.**

**Continuation of Ser. No. 130,895, Mar. 17, 1980, abandoned, which is a division of Ser. No. 41,378, May 22, 1979, Pat. No. 4,341,737. This application Apr. 21, 1983, Ser. No. 487,173**

**Int. Cl.³ C01C** *1/04*

**U.S. Cl. 423—360** **2 Claims**




1. A process for performing exothermic catalytic reactions in the gaseous phase, which comprises passing a synthesis gas selected from the group consisting of ammonia synthesis gas, methanol synthesis gas and methane synthesis gas into a reactor having a single-walled pressure shell, a plurality of annular catalyst beds with particulate catalyst in each bed, and a plurality of annular-shaped cross-flow heat exchange means, said annular catalyst beds and said annular heat exchange means being alternatingly disposed; passing said synthesis gas through the first of said beds in a radially inward direction away from the pressure containment walls of said reactor; passing the effluent from said first bed through the first of said cross-flow heat exchange means in said radially inward direction; passing the resulting effluent successively through the next bed and the next cross-flow heat exchange means for each of the remaining beds and heat exchange means in said radially inward direction, each cross-flow heat exchange means providing interstage feed-effluent heat exchange, the shell-side fluid of said heat exchange means flowing radially inwardly in a direction substantially normal to the direction in which the tube-side fluid flows; and recovering a gas which is enriched in the desired product.

4,423,023

## PROCESS FOR THE PRODUCTION OF HYDROCYANIC ACID FROM CARBON MONOXIDE AND AMMONIA

Louis J. Velenyi; Harley F. Hardman, both of Lyndhurst, and Fred A. Pesa, Aurora, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jul. 26, 1982, Ser. No. 401,464
Int. Cl.³ C01C 3/02
U.S. Cl. 423—376 19 Claims

1. A process for producing HCN by contacting CO and $NH_3$ with a catalyst comprising a noncarbonaceous, porous catalyst support, a Group VIII metal which comprises at least one member selected from the group consisting of Fe, Ni, Co and Ru, and carbon, wherein the metal is disposed on the pore surfaces of the support and the carbon is randomly bonded to the metal, the catalyst having from about 8 to about 30 percent metal loading and from about 5 to about 50 percent carbon loading.

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4,423,024

## SELECTIVE CONVERSION OF CHLORINATED ALKANES TO HYDROGEN CHLORIDE AND CARBON DIOXIDE

Thomas L. Wolford, Brush Prairie, Wash., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 129,285, Mar. 11, 1980, abandoned, which is a continuation-in-part of Ser. No. 16,641, Mar. 1, 1979, abandoned. This application May 26, 1982, Ser. No. 382,333
Int. Cl.³ C01B 21/20, 7/01
U.S. Cl. 423—437 15 Claims

1. A method of reacting at least one saturated aliphatic chlorinated hydrocarbon to selectively produce carbon dioxide and hydrogen chloride which comprises contacting a vaporized mixture containing said chlorinated hydrocarbon, at least a stoichiometric quantity of water and at least a stoichiometric quantity of oxygen with an effective amount of a suitable molecular sieve catalyst at a temperature and for a sufficient period of time to convert at least 10 mole percent of said chlorinated hydrocarbon to carbon dioxide and hydrogen chloride without substantial formation of free chlorine and phosgene.

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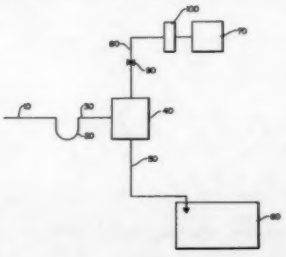
4,423,025

## DEGASSING MOLTEN SULFUR

Thomas H. Ledford, Baton Rouge, La., and Howard Lerner, Parsippany, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 174,433, Aug. 1, 1980, abandoned. This application Oct. 5, 1981, Ser. No. 308,604
Int. Cl.³ C01B 17/14
U.S. Cl. 423—578 R 14 Claims



1. A method for decreasing the concentration of hydrogen sulfide or hydrogen polysulfides present in molten sulfur comprising the addition to the molten sulfur of an effective amount of a non-ammonia degassing agent, selected from the class consisting of dithionates, dithionites, bisulfides, bisulfites and organo-phosphorous compounds selected from the class of compounds consisting of phosphates, phosphines, phosphites, phosphine oxides, phosphine sulfides and hypophosphates.

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4,423,026

## DENSIFICATION OF CAUSTIC MAGNESIA AND SINTERED PERICLASE BY ACID DOPING

Richard A. Snelgrove, Cherry Hill, N.J., assignor to General Refractories Company, Bala Cynwyd, Pa.

Filed Apr. 22, 1980, Ser. No. 142,659
Int. Cl.³ C01F 5/08
U.S. Cl. 423—636 13 Claims

8. A method for improving the densification of sintered periclase comprising:

(a) forming an admixture of $Mg(OH)_2$ and an aqueous acid or salt thereof selected from the group consisting of acetic acid, benzoic acid and hydrochloric acid, wherein the amount of acid or salt is from about 0.1 mole percent to 2 mole percent relative to said $Mg(OH)_2$;

(b) pressing said admixture into compacts; and

(c) high-firing said pressed compacts at a temperature between about 1300° C. and 1900° C. for a period of time from about 1 to 10 hours to obtain sintered periclase of high density.

10. A method for improving the properties of caustic magnesia comprising:

(a) forming an admixture of $Mg(OH)_2$ and an acid or a salt thereof selected from the group consisting of acetic acid, benzoic acid, and hydrochloric acid, wherein the amount of acid or salt is from about 0.1 mole percent to 2 mole percent relative to said $Mg(OH)_2$;

(b) caustic-firing said admixture at a temperature between about 500° C. and 1100° C. for a period of time from about 1 to 24 hours to obtain caustic magnesia of high density.

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4,423,027

## PHARMACEUTICAL COMPOSITIONS OF DEGLYCYRRHIZINATED LICORICE (DGL)

Lionel N. Simon, 11772 Las Palmas, Santa Ana, Calif. 92705, and Kameron W. Maxwell, 24671 Acropolis St., Mission Viejo, Calif. 92691

Filed Dec. 22, 1982, Ser. No. 452,085
Int. Cl.³ A61K 9/28, 9/36
U.S. Cl. 424—16 17 Claims

1. A tablet suitable for treating gastric or duodenal ulcers consisting essentially of an inner core containing deglycyrrhizinated licorice, a pharmaceutically acceptable disintegrant and an outer core including a pharmaceutically acceptable disintegrant, and a pharmaceutically acceptable coating of a film capable of being removed in the gastrointestinal tract.

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4,423,028

## CONTROL OF HOUSEFLIES BY FUMIGANT ACTIVITY

Frank H. Walker, Mill Valley, and Ordell L. Wolfe, San Jose, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 28, 1981, Ser. No. 334,704
Int. Cl.³ A01N 25/06, 25/18, 25/20, 57/00
U.S. Cl. 424—40 4 Claims

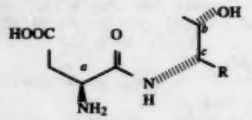
1. A method of controlling houseflies comprising contacting houseflies with a vapor consisting essentially of an insecticidally effective amount of O-(4-methylthiophenyl)-O,O-dimethylphosphorothioate.

## 4,423,029
## (S)-3-AMINO-4-[(S,S)-1-(1-HYDROXYETHYL)ALKYL AMINO]-4-OXO-BUTYRIC ACID COMPOUNDS SUITABLE AS NON-NUTRITIVE SWEETNERS

George P. Rizzi, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 25, 1981, Ser. No. 277,307
Int. Cl.³ C07C 101/30; A61K 7/22; A23L 1/236
U.S. Cl. 424—54 16 Claims

1. A compound of the formula:



wherein R is isopentyl, and wherein carbons a, b and c have the (S) configuration, and toxicologically acceptable salts thereof.

3. A composition of matter for oral ingestion comprising a sweetening amount of a compound or salt according to claim 1, and an ingestible carrier.

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## 4,423,030
## FLAVORED AQUEOUS ORAL COMPOSITION

Harry Hayes, Warrington, and Munir A. Ahmed, Firswood, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed May 6, 1982, Ser. No. 375,783
Claims priority, application United Kingdom, May 13, 1981, 8114566
Int. Cl.³ A61K 7/16, 7/26, 35/78
U.S. Cl. 424—58 11 Claims

1. An aqueous oral composition comprising an aqueous liquid dental cream or mouthwash vehicle having dispersed therein a two-tone flavour composition comprising essential oil and water-insoluble oleoresin extract of dried fruit, which oleoresin has higher sensation effect than said essential oil and is soluble in the said essential oil, the said flavour composition comprising about 0.01–5% by weight of the said aqueous oral composition, the said oleoresin comprising about 0.001–0.1% by weight of the said aqueous oral composition and the weight ratio of the said essential oil to the said oleoresin being at least about 10:1.

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## 4,423,031
## EYE MAKEUP PREPARATION

Yukio Murui, and Masaaki Saitoh, both of Yokohama, Japan, assignors to Shiseido Company, Ltd., Japan

Continuation of Ser. No. 92,267, Nov. 8, 1979, abandoned. This application Jul. 30, 1981, Ser. No. 288,506
Int. Cl.³ A61K 7/021, 31/74, 31/78, 31/00
U.S. Cl. 424—63 11 Claims

1. In an aqueous dispersion type eye makeup preparation comprising from 20 to 50% by weight of a film forming agent, from 1 to 10% by weight of at least one humectant, from 5 to 30% by weight of at least one pharmaceutically acceptable finely divided inorganic pigment, from 0.1 to 5% by weight of at least one surface active agent, from 0.1 to 3% by weight of at least one thickener, from 0.5 to 5% by weight of at least one plasticizer and a balance of water; wherein the improvement comprises that said film forming agent consists essentially of an aqueous emulsion of at least one member selected from the group consisting of copolymers derived from monomer mixtures of 30 to 80% by weight, of at least one alkyl acrylate having from $C_4$ to $C_{18}$ alkyl groups in the ester portion and 70 to 20% by weight of at least one alkyl methacrylate having from $C_1$ to $C_4$ alkyl groups in the ester portion.

## 4,423,032
## HAIR TREATMENTS

Yoshiaki Abe, Tokyo, and Rikio Tsushima, Wakayama, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

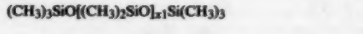
Filed Jan. 15, 1982, Ser. No. 339,636
Claims priority, application Japan, Feb. 5, 1981, 56-16172
Int. Cl.³ A61K 7/06, 7/09, 7/11
U.S. Cl. 424—70 12 Claims

1. A hair treatment composition selected from the group consisting of shampoo, hair rinse, hair treatment, pre-shampoo, hair spray, hair brushing lotion, hair setting lotion, hair liquid and hair tonic which comprises the following two ingredients (A) and (B):

(A) 0.05–10 wt% of at least one decomposition derivative of keratin material selected from the group consisting of (1) alkali salts of decomposition products obtained by oxidation of keratin material and (2) alkali salts of derivatives in the thiol group of decomposition products obtained by reduction of keratin material; and

(B) 0.1–30 wt% of at least one silicone derivative selected from the group consisting of

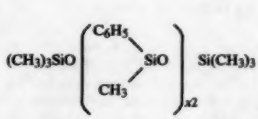
(1) dimethylpolysiloxanes of the formula (II)



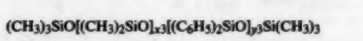
(II)

in which x1 is an integer of 3–650,

(2) methylphenylpolysiloxanes of the formula (III) or (IV)



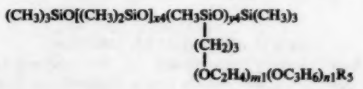
(III)



(IV)

in which x2 is an integer of 1–500, and the sum of x3 and y3 is an integer of 1–500,

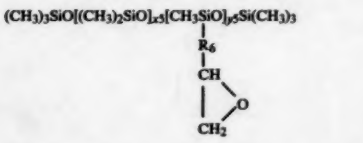
(3) polyether-modified silicone oils of the formula (V)



(V)

in which $R_5$ represents an alkyl group having 1–12 carbon atoms, an alkoxy group having 1–6 carbon atoms or a hydroxyl group, x4 is an integer of 1–100, y4 is an integer of 1–20, m1 is an integer of 0–50, and n1 is an integer of 0–50,

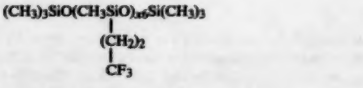
(4) epoxy-modified silicone oils of the formula (VI)



(VI)

in which $R_6$ represents an alkylene group having 1–3 carbon atoms, x5 is an integer of 1–500, and y5 is an integer of 1–50,

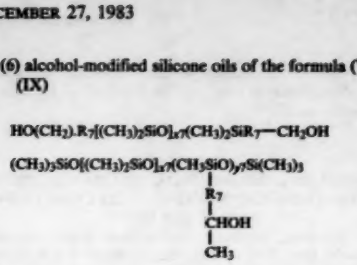
(5) fluorine-modified silicone oils of the formula (VII)



(VII)

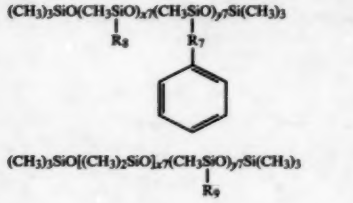
in which x6 is an integer of 1–400,

(6) alcohol-modified silicone oils of the formula (VIII) or (IX)



in which $R_7$ is not present or represents an alkylene grouping have 1–4 carbon atoms, and x7 and y7 are independently an integer of 1–500, and

(7) alkyl-modified silicone oils of the formula (X) or (XI)



in which $R_8$ represents an alkyl group having 2–18 carbon atoms, $R_9$ represents an alkyl group having 10–16 carbon atoms, and $R_7$, x7 and y7 have the same meanings as defined before, respectively, and a solvent.

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**4,423,033**

## PHARMACEUTICAL COMPOSITIONS

**Charles B. Taskis, Worthing, England, assignor to Beecham Group Limited, England**

**Continuation of Ser. No. 73,100, Sep. 6, 1979, abandoned. This application Feb. 2, 1981, Ser. No. 230,312**

**Claims priority, application United Kingdom, Dec. 8, 1978, 47768/78**

**Int. Cl.³ A61K *31/79, 31/43***

**U.S. Cl. 424—80** **11 Claims**

1. A pharmaceutical composition for the treatment of bacterial infections, which on reconstitution with water yields an injectable solution, which composition comprises a water soluble salt of amoxycillin, and polyvinylpyrrolidine (PVP) of molecular weight 1000 to 12000, wherein the weight ratio of amoxycillin salt, taken as the free acid equivalent weight, to PVP is 1:0.25 to 1:5.

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**4,423,034**

## PROCESS FOR THE PREPARATION OF ANTIBODIES

**Nobuaki Nakagawa; Kikuo Kotani; Shigeo Katsuragi; Kaoru Morita; Kunio Ohyama, and Toshiharu Noda, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan**

**Division of Ser. No. 197,535, Oct. 16, 1980, abandoned. This application Apr. 28, 1982, Ser. No. 372,824**

**Int. Cl.³ A61K *39/00*; C07G *7/00*; C07C *103/52***

**U.S. Cl. 424—85** **2 Claims**

1. A process for the preparation of specific antibodies which comprises sensitizing a mammal by administering to said mammal a peptide of the formula

H—Ser—Arg—Arg—Ala—Gln—Asp—
Phe—Val—Gln—Trp—Leu—Met—Asn—
Thr—OH

conjugated with albumin or a modified albumin, collecting blood from the mammal, and concentrating said antibodies from said collected blood.

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**4,423,035**

## METHOD FOR PREVENTING INJECTION SITE ABSCESS

**James G. Strayer, Waterloo, Nebr., assignor to Schering Corporation, Kenilworth, N.J.**

**Filed Aug. 10, 1981, Ser. No. 291,157**

**Int. Cl.³ A61K *39/10***

**U.S. Cl. 424—92** **3 Claims**

1. A method of preventing injection site abscess while vaccinating a food producing animal comprising injecting said animal with a vaccine that comprises inactivated whole cell cultures of Bordetella bronchiseptica, an effective amount of compatible adjuvant, an effective amount of non-antibiotic biocidal compound, and about 30 micrograms per milliliter of gentamicin sulfate.

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**4,423,036**

## ACID SOLUBLE PLATELET AGGREGATING MATERIAL ISOLATED FROM HUMAN UMBILICAL CORD

**Morris D. Schneider, Knoxville, Tenn., assignor to Research Corporation, Knoxville, Tenn.**

**Filed Aug. 3, 1981, Ser. No. 289,154**

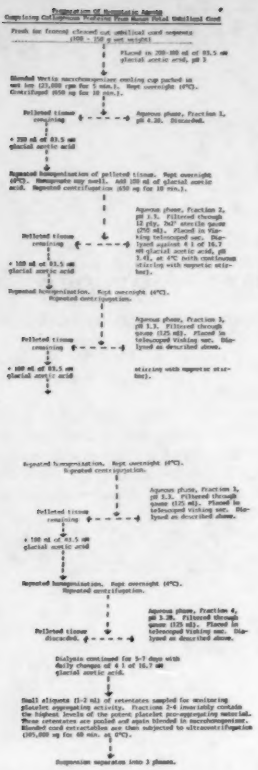
**Int. Cl.³ A61K *35/48*; C01N *1/00***

**U.S. Cl. 424—105** **14 Claims**

1. An acid soluble, pepsin sensitive non-dialyzable, proteinaceous hemostatic agent isolated from human umbilical cord tissue characterized by the ability to enhance platelet aggregating activity in mammalian blood, stable for extended period of time at temperatures as low as −85° C., containing the following average number of amino acid residues per 1,000 total amino acid residues:

| | | | |
|---|---|---|---|
| Lysine | 30.1 | Glycine | 287.8 |
| Histidine | 14.4 | Alanine | 111.9 |
| Hydroxylysine | 6.4 | Cysteine | 6.3 |
| Hydroxyproline | 36.1 | Valine | 41.2 |
| Aspartic Acid | 51.3 | Methionine | 8.1 |
| Threonine | 19.6 | Isoleucine | 18.9 |
| Serine | 38.6 | Leucine | 41.1 |
| Glutamic Acid | 90.3 | Tyrosine | 7.8 |
| Proline | 100.8 | Phenylalanine | 20.1 |
| | Arginine | 69.2 | |

which on SDS-PAGE electrophoresis produces bands characteristic of the following molecular weights:



| | |
|---|---|
| 300,000 | 200,000 |
| 250,000 | 132,000 |
| 220,000 | 116,000 |

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**4,423,037**

## INHIBITORS OF PEPTIDE HORMONE ACTION

**Michael Rosenblatt, Newton Highlands, and John T. Potts, Jr., West Newton, both of Mass., assignors to The General Hospital Corporation, Boston, Mass.**

**Filed May 13, 1982, Ser. No. 377,839**

**Int. Cl.³ A61K *37/00*; C07C *103/52***

**U.S. Cl. 424—177** **64 Claims**

1. A parathyroid hormone analogue, comprising:

a parathyroid peptide fragment wherein the three N-terminal amino acids and zero or more of the next four N-terminal amino acids are absent from a parathyroid hormone (PTH), from a parathyroid hormone fragment comprising at least the first 34 amino acids of said PTH, or from said parathyroid hormone or said parathyroid hormone fragment in which amino acid #34 is replaced with D- or L-tyrosine or in which amino acids #8 and #18 are each replaced with norleucine and amino acid #34 is replaced with D- or L-tyrosine, wherein the carboxy-terminal of said peptide fragment is optionally an amide, and wherein the N-terminal of said peptide fragment is optionally a D-amino acid.

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**4,423,038**

## PHOSPHORYL COMPOUNDS, PHARMACEUTICAL PREPARATIONS CONTAINING SUCH COMPOUNDS, AND THEIR USE

**Gerhard Baschang, Bettingen, Switzerland; Albert Hartmann, Grenzach, Fed. Rep. of Germany; Oskar Wacker, Basel, Switzerland, and Lajos Tarcsay, Grenzach-Wyhlen, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

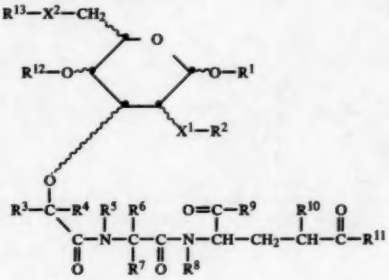
**Filed Jan. 19, 1982, Ser. No. 340,680**

**Claims priority, application Switzerland, Jan. 23, 1981, 439/81**

**Int. Cl.³ A61K *37/02*; C07C *103/52***

**U.S. Cl. 424—177** **24 Claims**

1. Hexopyranose compounds of the formula I,



(I)

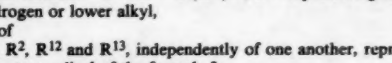
in which the hexopyranose is D-glucose, D-galactose or D-mannose,

each of

$X^1$ and $X^2$, independently of the other, represents a group of the formula —O— or —N($R^{14}$)—, $R^{14}$ representing hydrogen or lower alkyl,

each of

$R^1$, $R^2$, $R^{12}$ and $R^{13}$, independently of one another, represents a radical of the formula Ia

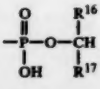


(Ia)

in which n represents 0 or 1, $Z^1$ represents carbonyl or thiocarbonyl, $Y^1$ represents unsubstituted or substituted alkylene which may be interrupted by iminocarbonyl or oxycarbonyl, $X^3$ represents a group of the formula —O— or —N($R^{14}$)—, wherein $R^{14}$ has the meaning given above, and $A^1$ represents a radical of the formula Ib,

(Ib)

in which $R^{15}$ represents an aliphatic or cycloaliphatic radical having at least 7 carbon atoms, or $A^1$ represents a group of the formula Ic,



(Ic)

in which $R^{16}$ represents hydrogen and $R^{17}$ represents 2-hydroxyethyl or 1,2-dihydroxyethyl, wherein at least

one hydroxy group is esterified or etherified by a radical having at least 7 carbon atoms, or wherein each of $R^{16}$ and $R^{17}$, independently of the other, represents esterified or etherified hydroxymethyl, the esterifying or etherifying radicals having at least 7 carbon atoms, or

each of

$R^1$, $R^2$, $R^{12}$ and $R^{13}$, independently of one another, represents hydrogen, acyl other than a radical of the formula Ia in which n represents 1, or a radical that can be removed under physiological conditions,

each of

$R^3$, $R^4$, $R^5$, $R^7$ and $R^8$, independently of one another, represents hydrogen or lower alkyl,

$R^6$ represents hydrogen or lower alkyl that is unsubstituted or substituted by a group of the formula Id,

$$-E-(Z^2-Y^2-X^4)_m-A^2 \quad \text{(Id)}$$

in which m represents 0 or 1, E represents a group of the formula —O—, —S— or $-N(R^{14})-$, $R^{14}$ having the meaning given above, $Z^2$ represents carbonyl or thiocarbonyl, $Y^2$ represents unsubstituted or substituted alkylene which may be interrupted by iminocarbonyl or oxycarbonyl, $X^4$ represents a group of the formula —O— or $-N(R^{14})-$, $R^{14}$ having the meaning given above, and $A^2$ represents a radical of the formula Ib or Ic; or by free or etherified hydroxy or mercapto, by esterified hydroxy or mercapto other than a group of the formula Id, by free amino or substituted amino other than a group of the formula Id, by free, esterified or amidated carboxy, by cycloalkyl, by carbocyclic aryl or by nitrogen-containing heteroaryl having 5 or 6 ring members in the heterocyclic ring, or

$R^5$ and $R^6$ together represent unsubstituted or substituted 1,3- or 1,4-lower alkylene,

each of

$R^9$ and $R^{11}$, independently of the other, represents a radical of the formula Ie,

$$-X^5-Y^3-X^6-A^3 \quad \text{(Ie)}$$

in which $X^5$ represents a group of the formula —O—, —S— or $-N(R^{14})-$, and $X^6$ represents a group of the formula —O— or $-N(R^{14})-$, in each case $R^{14}$ having the meaning given above, $Y^3$ represents unsubstituted or substituted alkylene which may be interrupted by iminocarbonyl or oxycarbonyl, and $A^3$ represents a radical of the formula Ib or Ic, or free hydroxy or mercapto, etherified hydroxy or mercapto other than a radical of the formula Ie, or free amino, or substituted amino other than a radical of the formula Ie, and

$R^{10}$ represents hydrogen or free, esterified or amidated carboxy,

it being possible for free functional groups to be present in protected form,

wherein an asymmetric carbon atom bearing the $R^3$ group has the D configuration, an asymmetric carbon atom bearing the $R^6$ group has the L configuraton and the asymmetric carbon atom bearing the N—$R^8$ group has the D configuration,

with the proviso that the compounds of the formula I have at least one radical $A^1$, $A^2$ or $A^3$, and with the further proviso that in compounds of the formula I in which at least one of the radicals $R^9$ and $R^{11}$ represents a group of the formula Ie, the pyranose ring is other than D-glucopyranose ring, or $R^1$ is other than hydrogen, or $X^1$ is other than the radical of the formula $-N(R^{14})-$ and $R^2$ is other than acyl, or $R^{12}$ is other than hydrogen, or the radical of the formula $-X^2-R^{13}$ is other than hydroxy, or $R^4$ is other than hydrogen, or $R^6$ is other than hydrogen or than lower alkyl that is unsubstituted or substituted by free of etherified hydroxy or mercapto, by esterified hydroxy or mercapto other than a group of the formula Id, or by free amino or substituted amino other than a group of the formula Id, by cycloalkyl, by carbocyclic aryl or by nitrogen-containing heteroaryl having 5 or 6 ring members in the heterocyclic ring, or $R^7$ is other than hydrogen, and pharmaceutically acceptable salts of such compounds.

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**4,423,039**

## DISAGGREGATED SOLUTIONS OF POLYPEPTIDES, THEIR PREPARATION AND USE

**A. Michael Albisser, and William D. Lougheed, both of Toronto, Canada, assignors to The Hospital for Sick Children, Toronto, Canada**

**Continuation of Ser. No. 147,444, May 7, 1980, abandoned. This application Apr. 16, 1981, Ser. No. 254,823**

**Claims priority, application Canada, Feb. 29, 1980, 346684**

**Int. Cl.³ A61K** *37/26*; **C07C** *103/52*; **C07G** *7/00*

**U.S. Cl. 424—178** **12 Claims**

1. A process for the preparation of an aqueous polypeptide solution having a pH in the range of 6.8 to 8.0, wherein said polypeptide is selected from the group consisting of insulin and glucagon, said process comprising

dissolving the polypeptide and a sufficient amount of bicarbonate ion in water to obtain an aqueous solution containing polypeptide in disaggregated form and bicarbonate ion in a concentration of 2 mmolar to 2.5 mmolar; and

maintaining the resulting solution during its formation at a pH above the isoelectric point of the polypeptide in aqueous solution;

wherein the bicarbonate ion increases the rate of dissolution of the polypeptide in the water and maintains the polypeptide in disaggregated form in the solution.

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**4,423,040**

## VEHICLE COMPOSITION CONTAINING 1-SUBSTITUTED AZACYCLOHEXAN-2-ONES

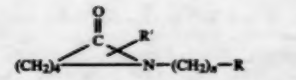
**Vithal J. Rajadhyaksha, Mission Viejo, Calif., assignor to Nelson Research & Development Company, Irvine, Calif.**

**Division of Ser. No. 137,248, Apr. 4, 1980, Pat. No. 4,316,893, which is a division of Ser. No. 725,490, Oct. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 588,247, Jun. 19, 1975, Pat. No. 3,989,816. This application Dec. 7, 1981, Ser. No. 327,998**

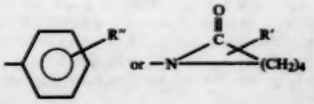
**Int. Cl.³ A61K** *31/56*, *31/10*, *31/71*, *31/505*

**U.S. Cl. 424—180** **16 Claims**

1. A composition comprising an effective amount of a physiologically active agent and a non-toxic, effective penetrating amount of a compound having the structural formula



wherein R' is H or a lower alkyl group having 1–4 carbon atoms, n is 0–17 and R is $-CH_3$,



wherein R'' is H or halogen.

## 4,423,041
## DETACKIFYING COMPOSITIONS

**Charles E. Clum, Kingston, N.J., and Lanny G. Felty, Pine Grove, Pa., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.**

**Continuation-in-part of Ser. No. 51,592, Jun. 25, 1979, abandoned. This application Jun. 29, 1981, Ser. No. 278,283**

**Int. Cl.³ A61K *31/695, 47/00***

**U.S. Cl. 424—184** **5 Claims**

1. A detackifying composition consisting essentially of a mixture of a silicone fluid and a silicone wax in a ratio of 9:1 to 1:3 wherein said silicone fluid is selected from the group consisting of dimethicone, methicone and cyclomethicone and said silicone wax is selected from the group consisting of stearoxy dimethicone and dipolyoxyethylene dimethyl silane.

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## 4,423,042
## INSECTICIDAL COMPOSITIONS

**Silvia Dorn, Dielsdorf, and Ulrich Schwieter, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

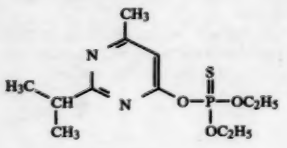
**Continuation of Ser. No. 226,324, Jan. 19, 1981, abandoned. This application Apr. 5, 1982, Ser. No. 365,675**

**Claims priority, application Switzerland, Feb. 1, 1980, 837/80**

**Int. Cl.³ A01N *57/16, 37/34***

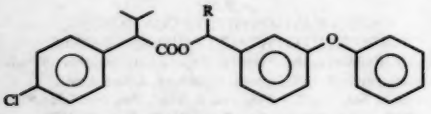
**U.S. Cl. 424—200** **4 Claims**

1. An insecticidal composition which comprises a mixture of a compound of the formula



I

and a compound of the formula



II

wherein R is cyano, in a ratio of I to II of from about 0.6:1 to about 1:0.6 and an inert carrier material.

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## 4,423,043
## AQUEOUS LIQUID FORMULATIONS FOR CONTROL OF BACTERIAL AND PROTOZOAL DISEASES

**Gerhard Lukas, Muttenz, and Kaya Atasoy, Münchenstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Continuation-in-part of Ser. No. 216,587, Dec. 15, 1980, abandoned, which is a continuation of Ser. No. 59,425, Jul. 20, 1979, abandoned. This application Feb. 5, 1982, Ser. No. 345,990**

**Claims priority, application Switzerland, Aug. 1, 1978, 8216/78**

**Int. Cl.³ A61K *31/625***

**U.S. Cl. 424—229** **1 Claim**

1. A concentrated but stable sulfonamide/trimethoprin formulation dilutable in livestock drinking water without causing sedimentation, which formulation comprises a solution of

(1) from 15 to 25%, by weight of the formulation, of a 1:4 to 1:5 by weight mixture of 2,6-diamino-5-(3,4,5-trimethoxybenzyl)-pyrimidine and a sulfonamide selected from the group consisting of

(i) sulfachlorpyrazine,

(ii) a salt of sulfachlorpyrazine,

(iii) sulfachlorpyridazine, and

(iv) a salt of sulfachlorpyridazine;

(2) from 0.1 to 1.0%, by weight of the formulation, of sodium dioctylsulfosuccinate;

(3) from about 1 to about 10%, by weight of the formulation, of a solubilizer selected from the group consisting of hydroxyethyltheophylline, nicotinic acid amide and sodium benzoate;

(4) from about 60 to 80%, by weight of the formulation, of a liquid carrier, said liquid carrier consisting essentially of

(i) an organic solvent selected from the group consisting of (a) N-methylpyrrolidone and (b) a combination of N-methylpyrrolidone and glycol monoethyl ether, and

(ii) water; and

(5) when a salt of sulfachlorpyrazine or a salt of sulfachlorpyridazine is present, a quantity of ethanolamine sufficient to solubilize said salt.

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## 4,423,044
## 3,4-DIHYDRO-5H-2,3-BENZODIAZEPINE DERIVATIVES AND PHARMACEUTICAL USE THEREOF

**Jeno Korösi; Tibor Lang; Ferenc Andrasi; Jozsef Szekely; Tamas Hamori; Tibor Balogh; Lajos Ila; Katalin Goldschmidt; Eleonora Sineger, and Imre Moravcsik, all of Budapest, Hungary, assignors to Egyt Gyógyszervegyészeti Gyár, Budapest, Hungary**

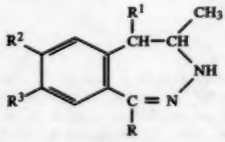
**Filed Feb. 25, 1982, Ser. No. 352,346**

**Claims priority, application Hungary, Mar. 12, 1981, 620/81**

**Int. Cl.³ A61K *31/55;* C07D *243/00, 405/04, 409/04***

**U.S. Cl. 424—244** **9 Claims**

1. 3,4-Dihydro-5H-2,3-benzodiazepine derivatives of the formula (I) and pharmaceutically acceptable acid addition salts thereof,



(I)

wherein

R represents a phenyl group optionally carrying one or two substituents selected from the group consisting of halogen, hydroxy, $C_{1-4}$ alkoxy and benzyloxy; a furyl or a thienyl group,

$R^1$ stands for a hydrogen atom or a $C_{1-4}$ alkyl group,

$R^2$ and $R^3$ each represent hydrogen atom, $C_{1-4}$ alkoxy, $C_{4-7}$ cycloalkoxy or benzyloxy group.

9. A pharmaceutical composition containing as an active ingredient an effective amount of at least one compound of the formula (I) as described in claim 1 or a pharmaceutically acceptable acid addition salt thereof, together with a conventional inert, non-toxic, solid or liquid carrier and/or additive.

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## 4,423,045
## THIADIZINES

**David Brown, Macclesfield; Robert I. Dowell, Congleton; Rodney B. Hargreaves, Poynton, and Brian Main, Sandbach, all of England, assignors to Imperial Chemical Industries PLC, London, England**

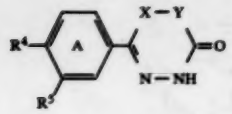
**Filed Nov. 16, 1981, Ser. No. 321,899**

**Claims priority, application United Kingdom, Nov. 14, 1980, 8036680**

**Int. Cl.³ C07D *285/16;* A61K *31/54***

**U.S. Cl. 424—246** **8 Claims**

1. A heterocyclic compound of the formula:



wherein

X is sulphur and Y is —$CH_2$—;

wherein $R^4$ and $R^5$, which may be the same or different, each is hydrogen, cyano, nitro or amino has the formula:

| | |
|---|---|
| —Q—CZ—$OR^6$ | —Q—$SO_2$—$NR^7R^8$ |
| —Q—CZ—$NR^7R^8$ | —Q—$SO_2$—$R^9$ |
| —Q—CZ—$R^9$ | —Q—SO—$R^9$ |

wherein

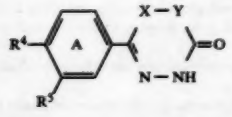
Q is a direct link, or is imino (—NH—), or is oxyalkylene of up to 4 carbon atoms, wherein Z is oxygen or sulphur and wherein $R^6$, $R^7$, $R^8$ and $R^9$, which may be the same or different, each is hydrogen, alkyl, alkenyl, cycloalkyl or alkoxyalkyl each of up to 6 carbon atoms, or aryl or arylalkyl each of up to 12 carbon atoms, or wherein $R^7$ and $R^8$ together with the adjacent nitrogen atom form a 5- or 6- membered fully-saturated heterocyclic ring, provided that $R^4$ and $R^5$ are not both hydrogen;

or wherein $R^4$ and $R^5$ are joined together such that with the benzene ring A they form a benzheterocyclic ring wherein the heterocyclic part is a 5- or 6- membered ring containing one oxygen, sulphur or nitrogen atom, and which heterocyclic part may optionally contain an oxo substituent or an alkyl or alkanoyl substituent each of up to 6 carbon atoms;

and wherein the benzene ring A may optionally bear one or more substituents;

or a salt thereof where appropriate.

**8.** A method for the treatment of acute or chronic heart failure in a warm-blooded animal in need of such treatment which comprises administering to said animal an effective amount of a heterocyclic compound of the formula:



wherein X is sulphur and Y is —$CH_2$—; wherein $R^4$ and $R^5$, which may be the same or different, each is hydrogen, cyano, nitro, amino or hydroxy, or alkylthio of up to 4 carbon atoms, or has the formula:

| | |
|---|---|
| —Q—CZ—$OR^6$ | —Q—$SO_2$—$NR^7R^8$ |
| —Q—CZ—$NR^7R^8$ | —Q—$SO_2$—$R^9$ |
| —Q—CZ—$R^9$ | —Q—SO—$R^9$ |

wherein Q is a direct link, or is imino (—NH—), or is oxyalkylene of up to 4 carbon atoms, wherein Z is oxygen or sulphur and wherein $R^6$, $R^7$, $R^8$ and $R^9$, which may be the same or different, each is hydrogen, alkyl, alkenyl, cycloalkyl or alkoxyalkyl each of up to 6 carbon atoms, or aryl or arylalkyl each of up to 12 carbon atoms, or wherein $R^7$ and $R^8$ together with the adjacent nitrogen atom form a 5- or 6- membered fully-saturated heterocyclic ring, provided that $R^4$ and $R^5$ are not both hydrogen;

or wherein $R^4$ and $R^5$ are joined together such that with the benzene ring A they form a benzheterocyclic ring wherein the heterocyclic part is a 5- or 6- membered ring containing one oxygen, sulphur or nitrogen atom, and which heterocyclic part may optionally contain an oxo substituent or an alkyl or alkanoyl substituent each of up to 6 carbon atoms; and wherein the benzene ring A may optionally bear one or more substituents;

or a salt thereof where appropriate, the amount of said compound being effective for said treatment.

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**4,423,046**

## ANTIBACTERIAL AND ANTIPROTOZOAL 1-METHYL-5-NITRO-2-(2-PHENYLVINYL)IMIDAZOLES

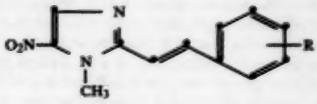
**John A. Carlson, Nassau, N.Y., assignor to Sterling Drug Inc., New York, N.Y.**

**Filed Apr. 5, 1982, Ser. No. 365,482**

**Int. Cl.³ A01N *43/50, 43/84;* C07D *233/94, 413/10***

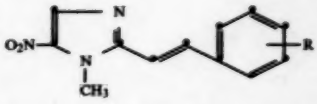
**U.S. Cl. 424—248.4** **10 Claims**

**1.** A member of the group consisting of (A) compounds having the formula:



where R is lower-alkoxyiminocarbonyl, amidinyl, 2-oxazolyl or 2-oxazinyl; and (B) acid-addition salts thereof.

**10.** A method of killing bacteria on surfaces or in media containing such bacteria which comprises treating said surfaces or such media with a composition containing, as the active ingredient therein, a bactericidally effective amount of a compound having the formula:



where R is lower-alkoxyiminocarbamyl, amidinyl, 2-oxazolyl or 2-oxazinyl.

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**4,423,047**

## PYRIMIDINE-2-SULPHIDES AND THEIR S-OXIDES FOR USE IN MEDICINE AND METHODS OF USE THEREFOR, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM, PROCESSES FOR THEIR PREPARATION AND PER SE NOVEL SULPHIDES AND S-OXIDES

**Tore Benneche; Mikkel J. Gacek, and Kjell Undheim, all of Oslo, Norway, assignors to Nyegaard & Co. A/S, Oslo, Norway**

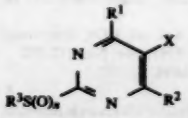
**Filed Jan. 9, 1981, Ser. No. 223,760**

**Claims priority, application United Kingdom, Jan. 10, 1980, 8000802**

**Int. Cl.³ A61K *31/505;* C07D *239/38***

**U.S. Cl. 424—251** **13 Claims**

**1.** A pharmaceutical composition for combating abnormal cell proliferation comprising as active ingredient an effective amount of a compound of the formula:



1

wherein X represents a halogen atom; n is 0, 1 or 2; $R^1$ and

$R^2$, which may be the same or different, each represents a hydrogen atom or a $C_{1-4}$ alkyl group, an amido group, a mono- or di-$C_{1-4}$ alkylamido group, a carboxyl group or a group of the formula —$COOR^a$ in which $R^a$ represents a $C_{1-8}$ alkyl, $C_{2-8}$ alkenyl or $C_{2-8}$ alkynyl group, a $C_{3-8}$ cycloalkyl or $C_{3-8}$ cycloalkenyl group, an aralkyl, aralkenyl or aralkynyl group with up to 4 carbon atoms in the aliphatic moiety, which moiety may be saturated or unsaturated, and up to 10 carbon atoms in the aryl moiety or a $C_{6-10}$ aryl group, the aryl moiety or group being optionally substituted by a $C_{1-4}$ alkyl group; and

$R^3$ represents a $C_{1-8}$ alkyl, $C_{2-8}$ alkenyl or $C_{2-8}$ alkynyl group, a $C_{3-8}$ cycloalkyl group, a $C_{3-8}$ cycloalkenyl group, the group Het, wherein Het is a 3–7 membered heterocyclic ring having one or two heteroatoms selected from oxygen, nitrogen or sulphur and optionally carrying one or more $C_{1-4}$ alkyl or $C_{6-10}$ aryl groups; a Het substituted $C_{1-8}$ alkyl, $C_{2-8}$ alkenyl or $C_{2-8}$ alkynyl group, an aralkyl, aralkenyl or aralkynyl group with up to 4 carbon atoms in the aliphatic moiety which moiety may be saturated or unsaturated and up to 10 carbon atoms in the aryl moiety or a $C_{6-10}$ aryl group, the aryl moiety or group being optionally substituted by a $C_{1-4}$ alkyl group, said moieties or groups being optionally substituted by one or more substituents selected from halogen atoms and oxo, nitro, hydroxy, mercapto, Het as herein defined, —$OR^b$, —$COOR^b$, —$SR^b$, $R^bSO$—, $R^bSO_2$—, wherein $R^b$ is as defined for $R^a$ or Het and is optionally substituted by one or more substituents selected from halogen, oxo, amino, hydroxy, mercapto, Het as herein defined, —$OR^a$, —$COOR^a$, —$SR^a$, $R^aSO$—, or $R^aSO_2$—; $C_{1-8}$ alkanoylamino, di($C_{1-8}$ alkyl)phosphonate and amino groups of the formula

in which $R^c$ and $R^d$, which may be the same or different, each represents a hydrogen atom or a $C_{1-4}$ alkyl, $C_{6-10}$ aralkyl or $C_{6-10}$ aryl group, the aryl moiety or group being optionally substituted by a $C_{1-4}$ alkyl group or $R^c$ and $R^d$ together with the nitrogen atom therebetween represents a perhydroazocinyl group; with the proviso that $R^3$ is other than a 1-alkyl-5-nitro-imidazolyl-2-alkyl grop when n is 0 or, where an acidic or basic group is present, a physiologically compatible salt thereof in association with a pharmaceutical carrier or excipient.

13. A compound which is:

2-(chloromethyl)sulfonyl-5-chloropyrimidine,

2-(3-oxobuten-1-yl)sulfonyl-5-chloropyrimidine,

3-(iodomethyl)sulfonyl-5-chloropyrimidine or

2-(5-chloropyrimidine-2-oxymethyl)sulfonyl-5-chloropyrimidine.

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**4,423,048**

## ANTIALLERGIC AND ANTIULCER 1-OXO-1H-THIAZOLO[3,2-a]PYRAMIDINE-2-CARBOXAMIDES AND INTERMEDIATES THEREFOR

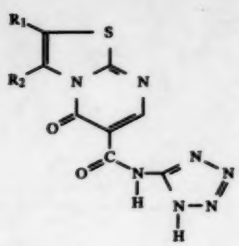
**Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.**

**Division of Ser. No. 96,631, Nov. 23, 1979, abandoned. This application Oct. 19, 1981, Ser. No. 312,372**

**Int. Cl.³ A61K *31/505***

**U.S. Cl. 424—251** **8 Claims**

1. A method of inhibiting gastric ulcers in a mammal which comprises administering to said mammal in an amount sufficient to inhibit said gastric ulcers a compound of the formula



or a pharmaceutically-acceptable cationic salt thereof, wherein $R_1$ and $R_2$ taken together are alkylene of 3 to 9 carbon atoms or phenylalkylene of 9 to 11 carbon atoms, with the proviso that the ring system so formed is 5- to 8-membered, and $R_1$ and $R_2$ taken separately are each hydrogen or alkyl of 1 to 5 carbon atoms.

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**4,423,049**

## 2-[4-[(4,4-DIALKYL-2,6-PIPERIDINEDION-1-YL)BUTYL]-1-PIPERAZINYL]PYRIMIDINES

**Davis L. Temple, Jr., Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.**

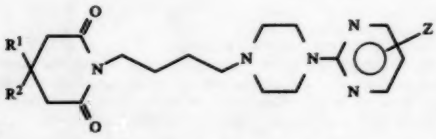
**Filed Dec. 28, 1981, Ser. No. 334,688**

**Int. Cl.³ A61K *31/505*; C07D *403/04***

**U.S. Cl. 424—251** **12 Claims**

1. A compound selected from the group consisting of a compound having Formula (I)

(I)



wherein $R^1$ and $R^2$ are independently selected from $C_1$ to $C_4$ alkyl groups; with Z being hydrogen, hydroxyl, halogen, or trifluoromethyl;

and the non-toxic pharmaceutically acceptable acid addition salts thereof.

9. The process for ameliorating an undesirable anxiety state in a manual comprising systemic administration to said mammal of an effective anxiolytic dose of from 0.01 to 40 mg/kg body weight of a compound claimed in claim 1.

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**4,423,050**

## 9-(1,3-DIHYDROXY-2-PROPOXYMETHYL)GUANINE AS ANTIVIRAL AGENT

**Julien P. H. Verheyden, Los Altos, and John C. Martin, Redwood City, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.**

**Continuation-in-part of Ser. No. 267,210, May 21, 1981, Pat. No. 4,355,032. This application May 24, 1982, Ser. No. 380,969**

**The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.**

**Int. Cl.³ A61K *31/52***

**U.S. Cl. 424—253** **3 Claims**

1. Method of treating viral infections in a warm blooded or a cold blooded animal having a viral infection which comprises administering an effective amount of 9-(1,3-dihydroxy-2-propoxymethyl)guanine or a pharmaceutically acceptable salt thereof or a composition containing same as an active ingredient.

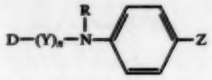
4,423,051

## 4-[(CYCLOALKYL OR CYCLOALKENYL SUBSTITUTED) AMINO, ALKYLAMINO OR ALKENYLAMINO]BENZOIC ACIDS, SALTS AND DERIVATIVES THEREOF

Robert G. Shepherd, South Nyack, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 137,199, Apr. 4, 1980, abandoned, which is a division of Ser. No. 881,457, Feb. 27, 1978, Pat. No. 4,227,014.
This application Jul. 20, 1981, Ser. No. 285,206
Int. Cl.³ A61K *31/44*; C07D *309/12, 213/55*; C07C *101/62*
U.S. Cl. 424—263 30 Claims

1. A compound of the formula:



wherein Z is a moiety of the formula:

wherein $R_1$ is selected from the group consisting of phenyl, benzyl, 3-pyridyl, pyridylmethyl and tetrahydropyranyl;

R is selected from the group consisting of hydrogen and methyl;

n is either zero or one;

Y is a divalent radical selected from the group consisting of unbranched or branched $C_1$–$C_{13}$ alkylene or alkenylene and is either unsubstituted or substituted with $C_1$–$C_4$ alkyl group;

and D is selected from the group consisting of $C_3$–$C_{16}$ cycloalkyl or $C_4$–$C_{17}$ cycloalkenyl and is either unsubstituted or substituted with $C_1$–$C_{13}$ alkyl, $C_4$–$C_8$ cycloalkyl, decahydronaphthyl, methylene, ethylidene, or isopropylidine group;

with the proviso that the total number of carbon atoms in D and Y shall not exceed twenty; and with the further proviso that when n is 1, D is not an unsubstituted cyclopropyl nor a cyclopropyl substituted with $C_1$–$C_{13}$ alkyl;

and the pharmaceutically acceptable non-toxic acid-addition and cationic salts thereof.

25. The method of inhibiting atherosclerotic lesion development in a mammal comprising the administration of an effective lesion-development inhibiting amount of a compound of claim 1.

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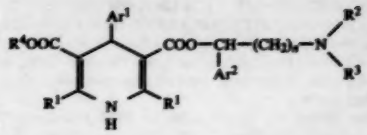
4,423,052

## 1,4-DIHYDROPYRIDINE-3,5-DICARBOXYLIC ACID ESTER DERIVATIVES

Kazuhiko Araki; Hideki Ao, both of Nakatsu; Kenichi Aihara, Yoshitomimachi, and Tomohiko Kimura, Izumi, all of Japan, assignors to Yoshitomi Pharmaceutical Industries Ltd., Japan

PCT No. PCT/JP81/00262, § 371 Date Jun. 1, 1982, § 102(e) Date Jun. 1, 1982, PCT Pub. No. WO82/01185, PCT Pub. Date Apr. 15, 1982
PCT Filed Oct. 2, 1981, Ser. No. 387,856
Claims priority, application Japan, Mar. 10, 1980, 55/138940
Int. Cl.³ C07D *213/55*; A61K *31/44*
U.S. Cl. 424—266 11 Claims

1. 1,4-Dihydropyridine-3,5-dicarboxylic acid ester derivatives represented by the formula:



wherein $Ar^1$ and $Ar^2$ are each the same or different and represent phenyl group which may be substituted by 1 to 3 substituents on the benzene ring, each substituent being independently selected from halogen atom, $C_{1-4}$ alkyl group, $C_{1-4}$ alkoxy group, hydroxyl group, nitro group, cyano group, methylenedioxy group, trihalomethyl group, di-$C_{1-4}$ alkylamino group, $C_{1-4}$ alkylthio group and $C_{1-4}$ alkylsulfonyl group; $R^1$ represents $C_{1-4}$ alkyl group; $R^2$ and $R^3$ are each the same or different and represent $C_{1-4}$ alkyl group or phenyl-$C_{1-2}$ alkyl group which may be substituted by 1 or 2 substituents on the benzene ring, each substituent being selected from halogen atom or $C_{1-4}$ alkoxy group; n is 1 or 2; and $R^4$ represents $C_{1-4}$ alkyl group; or the pharmaceutically acceptable acid addition salts thereof.

10. An antihypertensive composition comprising a compound of claim 1 in combination with an inert pharmaceutically acceptable excipient, said compound being present in a therapeutically effective amount.

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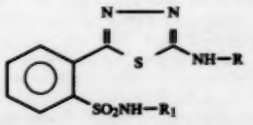
4,423,053

## DERIVATIVES OF 2-AMINO-5-(O-SULPHAMIDOPHENYL)-1,3,4-THIADIAZOL AS ANTIVIRAL AGENTS AND A PROCESS FOR THE PREPARATION THEREOF

Giovanni Orzalesi, Florence, Italy, assignor to Societa Italo-Britannica L. Manetti-H. Roberts & Co., Florence, Italy

Filed Mar. 16, 1982, Ser. No. 358,561
Claims priority, application Italy, Mar. 18, 1981, 48047 A/81
Int. Cl.³ A61K *31/41*; C07D *285/12*
U.S. Cl. 424—269 11 Claims

1. A compound of the formula



(I)

wherein R is a hydrogen atom, or a methyl, ethyl, isopropyl, n-butyl or allyl group and wherein $R_1$ is a hydrogen atom, or a methyl or ethyl group.

3. A pharmaceutical composition for the therapeutical treatment of virus infections in warm blood vertebrates, characterized in that it comprises as an active ingredient a therapeutically effective amount of a compound of formula I as defined in claim 1, in association with a pharmaceutical carrier or excipient.

**4,423,054**

## ANTIHYPERTENSIVE 4-THIAZOLIDINECARBOXYLIC ACIDS (SUBSTITUTED ALKYL DERIVATIVES)

**Junichi Iwao, Takarazuka; Masayuki Oya, Osaka; Toshio Baba, Saita; Tadashi Iso, Tondabayashi, and Takehisa Chiba, Kyoto, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan**

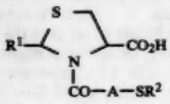
**Division of Ser. No. 23,397, Mar. 23, 1979, abandoned. This application Mar. 2, 1981, Ser. No. 239,600**

**Claims priority, application Japan, Apr. 8, 1978, 53-41632; Apr. 25, 1978, 53-49657; Jul. 3, 1978, 53-81116**

**Int. Cl.³ C07D *277/04*; A61K *31/425***

**U.S. Cl. 424—270** **17 Claims**

1. A compound of the formula



(I)

wherein

$R^1$ is selected from the group consisting of mercapto-lower alkyl, S-(lower alkanoyl)mercapto-lower alkyl, 2,6-dimethyl-5-heptenyl, cyclohexyl, and phenyl-lower alkyl, and the terms lower alkyl and lower alkanoyl refer to groups having 1 to 6 carbon atoms;

$R^2$ is hydrogen or benzoyl;

A is straight or branched alkylene of 1 to 3 carbon atoms; and pharmaceutically acceptable salts thereof.

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**4,423,055**

## 6-SUBSTITUTED-HYDROCARBON-2-(SUBSTITUTED-THIO)PENEM-3-CARBOXYLIC ACIDS

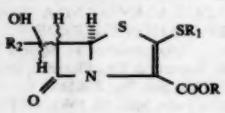
**Stuart W. McCombie, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.**

**Continuation-in-part of Ser. No. 62,875, Aug. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 2,471, Jan. 10, 1979, abandoned, and Ser. No. 91,610, Nov. 5, 1979, abandoned. This application Nov. 23, 1981, Ser. No. 324,317**

**Int. Cl.³ C07D *499/00*; A61K *31/425***

**U.S. Cl. 424—270** **16 Claims**

1. A compound of the formula:



wherein R is hydrogen, an alkali metal cation, a metabolisable ester group; $R_1$ is lower alkyl, lower alkyl substituted by one or more phenyl groups, amino(lower)alkyl, mono- or di-(lower-)alkylamino(lower)alkyl, carboxy(lower)alkyl, loweralkylcarbonylamino(lower)alkyl, halo(lower)alkylcarbonylamino(lower)alkyl, hydroxy(lower)alkyl, hydroxyaralkyl wherein the aralkyl moiety is a lower alkyl substituted by one or more phenyl groups, alkoxycarbonyl(lower)alkyl, or lower alkyl substituted with an unsubstituted or a lower alkyl substituted aromatic heterocyclic group having at least one nitrogen, oxygen or sulfur ring heteroatom; and $R_2$ is phenyl or substituted phenyl wherein said substituents are one or more of lower alkyl, lower alkoxy, or halogen, lower alkyl substituted by one or more phenyl groups, an unsubstituted or substituted aromatic heterocyclic group having at least one nitrogen, oxygen or sulfur heteroatom wherein said substituents are from 1 to 3 lower alkyl groups, lower alkyl substituted with an unsubstituted or a lower alkyl substituted aromatic heterocyclic group having at least one nitrogen, oxygen or sulfur ring heteroatom or hydroxyaralkyl wherein the aralkyl moiety is a lower alkyl substituted by one or more phenyl groups; and the pharmaceutically acceptable salts thereof.

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**4,423,056**

## 5(AMINOMETHYL)-4,5,6,7-TETRAHYDRO[D]THIAZOLE CONTAINING COMPOSITIONS FOR AND MEDICAL USE IN TREATING CIRCULATORY INSUFFICIENCIES

**Jacques G. Maillard, Versailles; Perre P. A. Delaunay, Herblay, and Jacky M. G. Legeoi, Palaiseau, all of France, assignors to Laboratoires Jacques Logeais, Issy-les-Moulineaux, France**

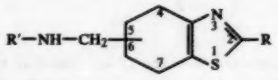
**Division of Ser. No. 160,458, Jun. 18, 1980, Pat. No. 4,337,343. This application Mar. 10, 1982, Ser. No. 356,617**

**Claims priority, application France, Jun. 20, 1979, 79 15774**

**Int. Cl.³ A61K *31/425***

**U.S. Cl. 424—270** **6 Claims**

4. A process for the treatment of circulatory insufficiencies which comprises administering to a human in need thereof an amount, effective for increasing the blood rate of flow, of a compound selected from the compounds of the formula:



(I)

in which:

the group R′—NH—$CH_2$— is in the 4, 5 or 6 position,

R is selected from hydrogen and $C_{1-6}$ alkyl,

R′ is selected from hydrogen and $C_{1-6}$ alkyl,

and a pharmaceutically acceptable acid addition salt thereof.

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**4,423,057**

## METHODS OF USE OF 1-[(SUBSTITUTED-NAPHTHYL)ETHYL]-IMIDAZOLE DERIVATIVES

**Keith A. M. Walker, Los Altos Hills, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.**

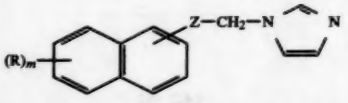
**Division of Ser. No. 19,202, Mar. 9, 1979, Pat. No. 4,277,486. This application Mar. 9, 1981, Ser. No. 241,772**

**The portion of the term of this patent subsequent to Apr. 17, 1996, has been disclaimed.**

**Int. Cl.³ A61K *31/415***

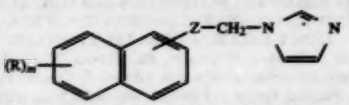
**U.S. Cl. 424—273 R** **2 Claims**

1. A method for preventing or treating convulsions in a mammal which comprises administering an effective amount of a compound of the formula



wherein m is the integer 1, 2 or 3; R is independently selected from the group $C_1$ to $C_6$ alkyl, $C_1$ to $C_6$ alkoxy, halo, trifluoromethyl and hydroxy when m is the integer 1, 2, or 3 and methylenedioxy when m is the integer 2; Z is hydroxymethylene, hydroxymethylene esterified with an alkanoic acid of 1 to 6 carbons atoms or with benzoic acid optionally substituted with one to three substituents independently selected from the group consisting of $C_1$ to $C_6$ alkyl, $C_1$ to $C_6$ alkoxy and halo, $C_1$ to $C_6$ alkoxymethylene, or $C_1$ to $C_6$ alkylthiomethylene; or pharmaceutically acceptable acid addition salts thereof.

2. A method of inhibiting gastric secretion in a mammal which comprises administering an effective amount of a compound of the formula



where m is the integer 1, 2 or 3; R is independently selected from the group $C_1$ to $C_6$ alkyl, $C_1$ to $C_6$ alkoxy, halo, trifluoromethyl and hydroxy when m is the integer 1, 2 or 3 and methylenedioxy when m is the integer 2; Z is hydroxymethylene, hydroxymethylene esterified with an alkanoic acid of 1 to 6 carbon atoms or with benzoic acid optionally substituted with one to three substituents independently selected from the group consisting of $C_1$ to $C_6$ alkyl, $C_1$ to $C_6$ alkoxy and halo, $C_1$ to $C_6$ alkoxymethylene, or $C_1$ or $C_6$ alkythiomethylene; or pharmaceutically acceptable acid addition salts thereof.

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**4,423,058**

## COMBATING PESTS WITH NOVEL PYRAZOL-4-YL N-ALKYLCARBAMATES

**Fritz Maurer, Wuppertal; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

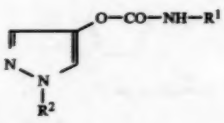
**Filed Mar. 22, 1982, Ser. No. 360,138**

**Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114833**

**Int. Cl.³ A01N *435/56*; C07D *231/18***

**U.S. Cl. 424—273 P** **9 Claims**

1. A 1-substituted-pyrazol-4-yl N-alkylcarbamate of the formula



in which

$R^1$ is an alkyl group having 2 to 5 carbon atoms, an alkenyl or alkinyl group, each having 3 to 5 carbon atoms or a cycloalkyl group having 3 to 6 carbon atoms, and

$R^2$ is an alkyl group having 1 to 6 carbon atoms, an alkenyl or alkinyl group, each having 3 to 5 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, an aralkyl group having 6 to 10 carbon atoms in the aryl part and 1 or 2 carbon atoms in the alkyl part, or a phenyl group.

8. A method for combating insects and nematodes comprising applying to the insects or nematodes, or to a hatibat thereof, an insecticidally or nematicidally effective amount of a compound according to claim 1.

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**4,423,059**

## FUNGICIDAL N-(PYRROLIDINOACETYL)-ANILINES

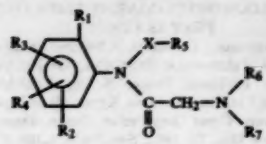
**Adolf Hubele, Magden; Walter Kunz, Oberwil, both of Switzerland, and Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Division of Ser. No. 39,012, May 14, 1979, Pat. No. 4,244,962, which is a division of Ser. No. 905,312, May 12, 1978, Pat. No. 4,165,381, which is a division of Ser. No. 726,320, Sep. 24, 1976, Pat. No. 4,098,895. This application Nov. 10, 1980, Ser. No. 205,357**

**Int. Cl.³ A61K *31/40*; C07D *207/04***

**U.S. Cl. 424—274** **8 Claims**

1. A compound of the formula



(I)

wherein

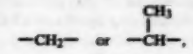
$R_1$ represents a $C_1$–$C_4$-alkyl group, a $C_1$–$C_4$-alkoxy group or a halogen atom,

$R_2$ represents a hydrogen atom, a $C_1$–$C_3$-alkyl group, a $C_1$–$C_4$-alkoxy group or a halogen atom,

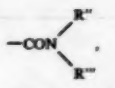
$R_3$ represents a hydrogen atom, a $C_1$–$C_3$-alkyl group or a halogen atom,

$R_4$ represents a hydrogen atom or a methyl group, with the proviso that the total number of carbon atoms contained by the substituents $R_1$, $R_2$, $R_3$ and $R_4$ on the phenyl ring does not exceed 8, and

X represents



$R_5$ represents —COOR', —COSR' or



wherein each of R', R'' and R''' independently represents a methyl or ethyl group,

$R_6$ and $R_7$ together with the nitrogen atom to which they are attached are pyrrolidine, or salts of the compounds of the formula I with an inorganic or organic acid.

6. A method of controlling phytophathogenic fungi or of preventing fungus attack, which comprises applying to the plants, parts of plants or their environment, a fungicidally effective amount of a compound of the formula I according to claim 1.

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**4,423,060**

## ALDOSE REDUCTASE INHIBITION BY 1-METHYL-5-(4-METHYLBENZOYL)-1H-PYRROLE-2-ACETIC ACID

**Dushan M. Dvornik, Mount Royal, and Nicole Simard-Duquesne, Montreal, both of Canada, assignors to Ayerst, McKenna & Harrison Inc., Montreal, Canada**

**Filed Aug. 17, 1981, Ser. No. 293,585**

**Int. Cl.³ A61K *31/40***

**U.S. Cl. 424—274** **3 Claims**

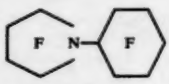
1. A method of treating a diabetes mellitus associated complication selected from the group consisting of cataracts, neuropathy, nephropathy and retinopathy in a diabetic mammal in need of such treatment which comprises administering to said mammal an effective aldose reductase inhibiting amount of 1-methyl-5-(4-methylbenzoyl)-1H-pyrrole-2-acetic acid, or a therapeutically acceptable salt thereof with an organic or inorganic base.

## 4,423,061
## PERFLUOROCYCLOAMINE EMULSION PREPARATION

Kazumasa Yokoyama, Toyonaka; Chikara Fukaya, Osaka; Yoshio Tsuda, Takarazuka; Taizo Ono, Osaka; Yoshio Arakawa, Suita; Yoshihisa Inoue, Kyoto; Youichiro Naito, Hirakata, and Tadakazu Suyama, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Dec. 28, 1982, Ser. No. 454,106
Claims priority, application Japan, Aug. 30, 1982, 57-151098
Int. Cl.³ A61K *31/40*
U.S. Cl. 424—274 6 Claims

1. A perfluorocycloamine emulsion preparation having oxygen carrying ability comprising 5–50% (w/v) of perfluorocycloamine of the general formula



wherein any position may optionally be substituted with a perfluoromethyl group, as an oxygen carrying component, 1–5% (w/v) of an emulsifying agent and a balance of a physiologically acceptable aqueous solution, and the emulsion having a particle diameter of 0.3μ or less.

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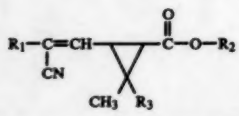
## 4,423,062
## CYANOVINYL PYRETHROIDS AND PESTICIDAL USE THEREOF

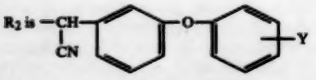
Dale G. Brown, Hopewell, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 124,153, Feb. 25, 1980, Pat. No. 4,325,969, Continuation of Ser. No. 937,360, Aug. 28, 1978, abandoned.
This application Jan. 22, 1982, Ser. No. 341,973
Int. Cl.³ A01N *43/02, 37/34*
U.S. Cl. 424—275 4 Claims

4. A method for the control of insect pests of agriculturally important crops and ectoparasites of domesticated warm-blooded animals comprising contacting the insects and ectoparasites, or applying to their hosts and to their habitat an insecticidally effective amount compound of the formula:



wherein
$R_1$ is



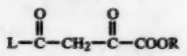
$R_3$ is hydrogen or methyl; and Y is hydrogen, halogen, methyl or methoxy.

## 4,423,063
## 2,4-DIOXO-4-SUBSTITUTED-1-BUTAOIC ACID DERIVATIVES USEFUL IN TREATING URINARY TRACT CALCIUM OXALATE LITHIASIS

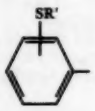
Clarence S. Rooney, Worcester, Pa.; Haydn W. R. Williams, Dollard des Ormeaux, Canada; Edward J. Cragoe, Jr., Lansdale, Pa., and Arthur A. Patchett, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 220,648, Dec. 29, 1980, Pat. No. 4,337,258.
This application Mar. 5, 1982, Ser. No. 354,995
Int. Cl.³ A61K *31/335, 31/235, 31/19*; C07C *149/40*
U.S. Cl. 424—278 7 Claims

1. A compound of the formula:



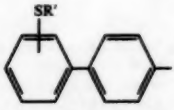
where
R is hydrogen or $C_{1-4}$ alkyl; and
L is a lipophilic group having the structure:



(1)

where R′ is (a) hydrogen; (b) $C_{1-3}$ alkyl; (c) benzyl; or (d) (3,4-dihydro-3-hydroxy-2H-1,5-benzodioxepin-3-yl)methyl; provided that positions 2 and 6 of

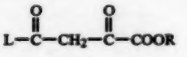
may not be substituted; or



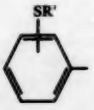
(2)

where R′ has the same meaning as above; or a pharmaceutically acceptable salt thereof.

7. A pharmaceutical composition for use in treating or preventing the formation of calcium oxalate urinary tract lithiasis, especially kidney or bladder stones, comprising a pharmaceutically acceptable carrier and a therapeutically effective amount of a compound of the formula:



where
R is hydrogen or $C_{1-4}$ alkyl; and
L is a lipophilic group having the structure

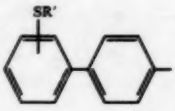


(1)

where R′ is (a) hydrogen; (b) $C_{1-3}$ alkyl; (c) benzyl; or (d)

(3,4-dihydro-3-hydroxy-2H-1,5-benzodioxepin-3-yl)methyl; provided that positions 2 and 6 of

may not be substituted; or



where R′ has the same meaning as above;
or a pharmaceutically acceptable salt thereof.

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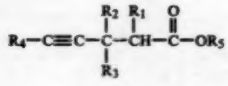
**4,423,064**

## BIOCIDAL ESTERS OF ALKYNOIC ACIDS

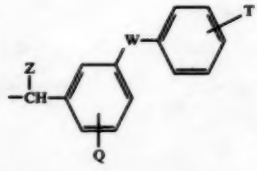
**Thomas N. Wheeler, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.**

**Filed Jun. 29, 1981, Ser. No. 278,721**
**Int. Cl.³ A01N** *37/34, 37/06;* **C07C** *69/606, 121/75*
**U.S. Cl. 424—304** **27 Claims**

**7.** A compound of the formula:

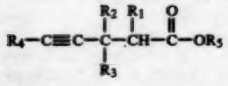


wherein:
$R_1$ is ethyl, isopropyl or cyclopropyl,
$R_2$ and $R_3$ are independently hydrogen or methyl,
$R_4$ is hydrogen, and
$R_5$ is

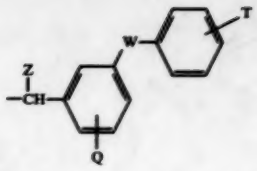


wherein:
Z is cyano,
Q and T are hydrogen, and
W is oxygen.

**27.** A method of controlling insects and mites which comprises subjecting them to an insecticidally or miticidally effective amount of a compound of the formula:



wherein:
$R_1$ is ethyl, isopropyl or cyclopropyl,
$R_2$ and $R_3$ are independently hydrogen or methyl,
$R_4$ is hydrogen, and
$R_5$ is



wherein:
(2) Z is cyano,
Q and T are hydrogen, and
W is oxygen.

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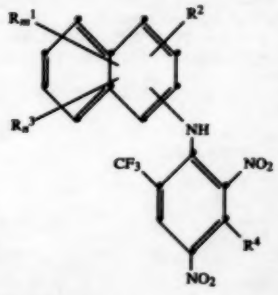
**4,423,065**

## NAPHTHALENAMINE INSECTICIDES

**Albert J. Clinton, deceased, late of Indianapolis, Ind. (by American Fletcher National Bank and Trust Company, Administrator), and George O. P. O'Doherty, Greenfield, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

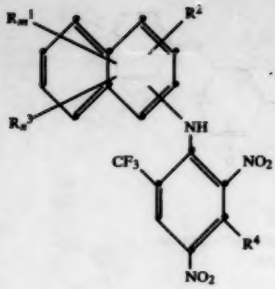
**Filed May 4, 1982, Ser. No. 374,802**
**Int. Cl.³ A01N** *37/34, 33/06*
**U.S. Cl. 424—304** **36 Claims**

**1.** A method for suppressing insects which comprises applying to a locus of the insects an insecticidally-effective amount of a compound of the formula



wherein:
$R^1$ is $C_1$–$C_4$ alkyl;
$R^2$ is halogen, phenyl, nitro, cyano, $C_1$–$C_4$ fluoroalkyl, $C_1$–$C_4$ fluoroalkoxy or $C_1$–$C_4$ fluoroalkylthio;
$R^3$ is halogen;
$R^4$ is hydrogen or halogen;
m is 0, 1 or 2; and
n is 0 or 1;
with the proviso that $R^2$ and the dinitroaniline moiety are on the same ring.

**19.** A method of killing insects which consume living tissues of a host animal which comprises orally or percutaneously administering to a host animal infested with such insects an ectoparasiticidally-effective amount of a compound of the formula



wherein:

$R^1$ is $C_1$–$C_4$ alkyl;

$R^2$ is halogen, phenyl, nitro, cyano, $C_1$–$C_4$ fluoroalkyl, $C_1$–$C_4$ fluoroalkoxy or $C_1$–$C_4$ fluoroalkylthio;

$R^3$ is halogen;

$R^4$ is hydrogen or halogen;

m is 0, 1 or 2; and

n is 0 or 1;

with the proviso that $R^2$ and the dinitroaniline moiety are on the same ring.

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**4,423,066**

**COMBATING ARTHROPODS WITH PERFLUOROBENZYL 2,2-DIMETHYL-3-VINYL-CYCLOPROPANE CARBOXYLATES**

**Rainer Fuchs, Wuppertal; Klaus Naumann, Cologne; Wolfgang Behrenz, Overath; Ingeborg Hammann, Cologne; Bernhard Homeyer, Leverkusen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

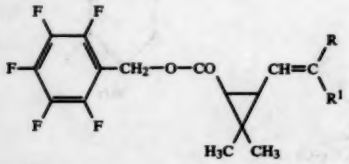
**Filed Feb. 21, 1979, Ser. No. 13,660**

**Claims priority, application Fed. Rep. of Germany, Mar. 11, 1978, 2810634**

**Int. Cl.**[3] **A01N** *53/00*; **A61K** *31/215*; **C07C** *69/753*

**U.S. Cl. 424—305** **10 Claims**

1. A pentafluorobenzyl 2,2-dimethyl-3-vinylcyclopropane carboxylate of the formula



in which

R is hydrogen or halogen, and

$R^1$ is phenyl, halogeno phenyl or $C_1$-$_6$-alkyl phenyl, or

R and $R^1$ together constitute an alkylene chain with two to six carbon atoms.

8. An arthropodicidal composition containing as active ingredient an arthropodicidally effective amount of a compound according to claim 1 in admixture with a diluent.

9. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a compound according to claim 1.

**4,423,067**

**NOVEL CARBACYCLINS, THEIR PREPARATION AND USE**

**Werner Skuballa; Bernd Radüchel; Norbert Schwarz; Helmut Vorbrüggen; Jorge Casals-Stenzel; Ekkehard Schillinger, and Michael H. Town, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany**

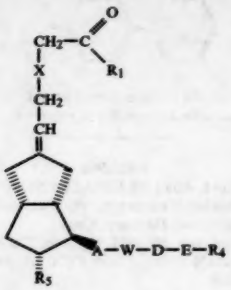
**Filed Dec. 21, 1981, Ser. No. 333,099**

**Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3048906**

**Int. Cl.**[3] **C07C** *177/00*; **A61K** *31/557*

**U.S. Cl. 424—305** **22 Claims**

1. A carbacyclin derivative of the formula:



wherein

$R_1$ is $OR_2$ or $NHR_3$,

$R_2$ is hydrogen; $C_{1-10}$ alkyl; $C_{1-10}$ alkyl substituted by halogen, $C_{1-4}$ alkoxy, $C_{6-10}$ aryl, $C_{6-10}$ aryl substituted as defined below for $R_2$ aryl, di-$C_{1-4}$-alkylamino or tri-$C_{1-4}$-alkylammonium; $C_{4-10}$-cycloalkyl; $C_{4-10}$-cycloalkyl substituted by $C_{1-4}$-alkyl; $C_{6-10}$-aryl; $C_{6-10}$-aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 alkyl groups of 1–4 carbon atoms each, or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy, or alkoxy group of 1–4 carbon atoms; or a 5- or 6-membered aromatic heterocycle containing one O, N or S atom, all other atoms being C- atoms;

$R_3$ is hydrogen or an acyl group of a $C_{1-15}$ hydrocarbon carboxylic or sulfonic acid;

X is oxygen;

A is a —$CH_2$—$CH_2$—, trans—CH=CH—, or —C≡C— group;

W is a free or functionally modified hydroxymethylene group or a free or functionally modified

group wherein the OH-group can be in the $\alpha$- or $\beta$-position;

$R_5$ is a free or functionally modified hydroxy group;

wherein the term "functionally modified" refers to replacement of the H-atom on the hydroxy group with an acyl group of a $C_{1-15}$ hydrocarbon carboxylic or sulfonic acid or tetrahydropyranyl, tetrahydrofuranyl, p-ethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl, or tri-p-benzylsilyl;

D is $C_{1-10}$ alkylene, or $C_{2-10}$ alkenylene, each optionally substituted by fluorine, 1,2-methylene or 1,1-trimethylene;

E is —C≡C—;

$R_4$ is a $C_{1-10}$ aliphatic group; a $C_{1-10}$ aliphatic group substituted by $C_{6-10}$-aryl or $C_{6-10}$-aryl in turn substituted as defined for $R_2$ above; $C_{4-10}$-cycloalkyl; $C_{4-10}$-cycloalkyl substituted by $C_{1-4}$ alkyl; $C_{6-10}$-aryl; $C_{6-10}$-aryl substituted as defined for $R_2$ aryl above; or a 5- or 6-membered aro-

matic heterocycle containing one O, N or S-atom, all other atoms being C-atoms; or, when $R_2$ is hydrogen, a physiologically compatible salt thereof with a base.

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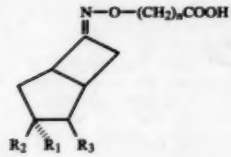
**4,423,068**

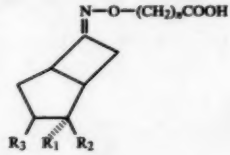
## (3.2.0) BICYCLOHEPTANONE OXIME ETHERS WITH THERAPEUTIC PROPERTIES

**Tsung-tee Li, Los Altos Hills, and Michael Marx, Sunnyvale, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.**

**Filed Jul. 14, 1982, Ser. No. 397,951**
**Int. Cl.³ C07C 131/02; A61K 31/215, 31/195**
**U.S. Cl. 424—305** **25 Claims**

**1.** A compound chosen from those represented by the formulas


(1)


(2)

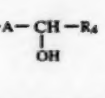
and the pharmaceutically acceptable non-toxic salts and esters thereof, wherein:

n is an integer from one to four;

$R_1$ is hydroxy;

$R_2$ is hydrogen; or

$R_1$ and $R_2$ together are an oxo group; and $R_3$ is



wherein

A is $—CH_2—CH_2—$; trans—CH=CH—; or —C≡C—; and

$R_4$ is linear or branched alkyl of one to twelve carbons, cycloalkyl of three to eight carbons, or phenyl optionally substituted with one or two identical substituents selected from the group consisting of lower alkyl, lower alkoxy, hydroxy, trifluoromethyl and halo; and optionally substituted phenylalkyl.

**25.** A method for preventing or treating cardiovascular disorders in mammals which method comprises administering to a subject in need of such treatment a therapeutically effective amount of a compound of claim **1** or a pharmaceutically acceptable non-toxic salt and ester thereof.

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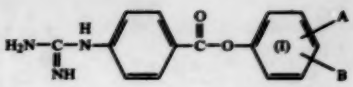
**4,423,069**

## CONTRACEPTIVE METHOD

**Joanne M. Kaminski, Chicago; Ludwig Bauer, Wilmette, and Lourens Zaneveld, Forest Park, all of Ill., assignors to University of Illinois Foundation, Urbana, Ill.**

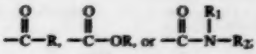
**Filed Jan. 20, 1982, Ser. No. 340,975**
**Int. Cl.³ A61K 31/155, 31/245**
**U.S. Cl. 424—310** **4 Claims**

**1.** A method for inhibiting conception in a mammal which comprises maintaining in the genital tract of said mammal an effective amount of a compound having the formula


(I)

or a pharmaceutically acceptable salt thereof,

in which A is halo, trihalomethyl, cyano, formyl, R, —OR,



and B is hydrogen or A;

wherein R is a lower alkyl group having up to 8 carbon atoms, and $R_1$ and $R_2$ are hydrogen or a lower alkyl group having up to 8 carbon atoms.

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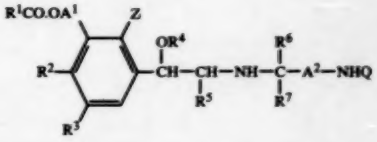
**4,423,070**

## ESTERS

**Geraint Jones; John Preston, and David S. Thomson, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England**

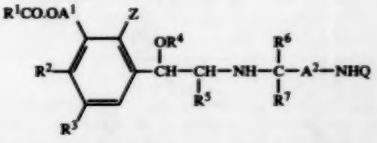
**Filed Nov. 23, 1977, Ser. No. 855,004**
**Claims priority, application United Kingdom, Dec. 16, 1976, 52553/76; Sep. 30, 1977, 40773/77**
**Int. Cl.³ C07C 69/14, 69/16; A61K 31/22**
**U.S. Cl. 424—311** **5 Claims**

**1.** An ester of the formula:

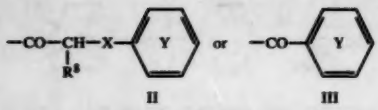

I

wherein $R^1$ is an isopropyl, t-butyl, isobutyl or (cyclopentyl)-methyl radical; $R^2$ is a radical of the formula $R^1CO.O—$; $R^3$, $R^4$ an $R^5$ are hydrogen; $R^6$ and $R^7$ are both hydrogen or methyl radicals; $A^1$ is a direct bond; $A^2$ is a methylene radical; Z is hydrogen; and Q is a phenylacetyl, phenoxyacetyl or 2-phenyl-propionyl radical; or a pharmaceutically-acceptable acid-addition salt thereof.

**4.** A method for the topical treatment of an area of inflammation affecting the skin of a warm-blooded animal which comprises administering to said area of said animal requiring such treatment an effective amount of an ester of the formula:


I

wherein $R^1$ is a $C_{1-11}$-alkyl or ($C_{3-6}$-cycloalkyl)-$C_{1-5}$-alkyl radical, or a phenyl or benzyl radical optionally bearing a $C_{1-6}$-alkyl or $C_{1-6}$-alkoxy radical as a nuclear substituent; one or $R^2$ and $R^3$ is hydrogen; the other of $R^2$ and $R^3$ is a radical of the formula $R^1CO.O—$ wherein $R^1$ has the meaning stated above; $R^4$ and $R^5$ are hydrogen; $R^6$ and $R^7$ are hydrogen, or methyl radicals; $A^1$ is a direct bond or a methylene radical; $A^2$ is a methylene radical; Z is hydrogen or chlorine; and Q is a radical of the formula:



II III

wherein $R^8$ is hydrogen or a methyl radical, X is a direct bond or oxygen, and benzene ring Y optionally bears a halogen atom, or trifluoromethyl, $C_{1-6}$-alkyl or $C_{1-6}$-alkoxy radical as a substituent; or a pharmaceutically acceptable acid-addition salt thereof.

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**4,423,071**

## POLYOL DERIVATIVES, PROCESSES FOR PREPARING THE SAME AND THEIR USES IN THERAPEUTICS

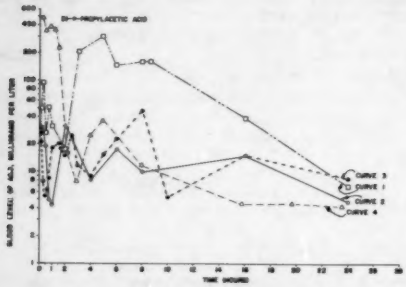
**Michel Chignac, Sisteron; Claude Grain, Volonne; Fernand Jammot, Sisteron; Charles Pigerol, Saint-Ouen; Pierre Eymard, Fontaine, and Bernard Ferrandes, Claix, all of France, assignors to Sanofi, Courbevoie, France**

**Filed Mar. 3, 1980, Ser. No. 126,191**

**Claims priority, application United Kingdom, Mar. 6, 1979, 7907932**

**Int. Cl.³ A61K *31/22***

**U.S. Cl. 424—311** **6 Claims**




**1**. A pharmaceutical or veterinary composition for treating anoxia, convulsive states and seizures, which comprises as essential active ingredient at least one glyceryl ester selected from the group consisting of glyceryl 1,2-bis-(di-n-propylacetate) and glyceryl 1,3-bis-(di-n-propylacetate), in combination with a pharmaceutical carrier or excipient therefor, in dosage unit form containing 50 to 600 mg. of active ingredient.

**3**. A method of treating anoxia, convulsive states and seizures in a human being in need of such treatment, which comprises administering to said human being an effective dose of from 10 mg/kg to 50 mg/kg of a glyceryl ester selected from the group consisting of glyceryl 1,2-bis-(di-n-propylacetate) and glyceryl 1,3-bis-(di-n-propylacetate).

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**4,423,072**

## METHOD FOR IMPROVING THE METABOLIC STABILITY AND SURVIVAL OF NEONATAL PIGS

**Tim S. Stahly, Lexington, Ky., assignor to The University of Kentucky Research Foundation, Lexington, Ky.**

**Continuation-in-part of Ser. No. 107,886, Dec. 28, 1979, Pat. No. 4,329,359. This application Apr. 13, 1982, Ser. No. 368,007**

**The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.**

**Int. Cl.³ A61K *31/23*, *31/045***

**U.S. Cl. 424—312** **8 Claims**

**1**. A method of improving the metabolic stability of neonatal pigs and increasing their survival rate which comprises administering to a pregnant sow during its latter stages of gestation, up to about 80 days prior to parturition, an effective amount of a material selected from the group consisting of

(1) a dihydroxy alkanol having 3 to 10 carbon atoms;

(2) a triglyceride of glycerol and fatty acids wherein at least one of the fatty acid moieties contains 8 to 12 carbon atoms with the remaining acid moieties containing 13 to 20 carbon atoms;

(3) the mono and diol esters of said dihydroxy and said fatty acids wherein at least one of the fatty acid moieties contains 8 to 12 carbon atoms with the remaining acid moieties containing 13 to 20 carbon atoms; and

(4) the ester of said dihydroxy alkanol and said fatty acids containing 13 to 20 carbon atoms.

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**4,423,073**

## FLUORINATED DIAMINOPENTENE DERIVATIVES

**Fritz Gerhart, Kehl-Leutesheim, Fed. Rep. of Germany, and Viviane Van Dorsselaer, Strasbourg, France, assignors to Merrell Toraude et Compagnie, Strasbourg, France**

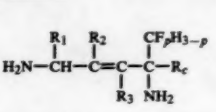
**Filed Aug. 11, 1982, Ser. No. 407,226**

**Claims priority, application United Kingdom, Aug. 19, 1981, 8125360**

**Int. Cl.³ C07C *101/28*, *87/26*; A61K *31/13*, *31/22*, *31/195***

**U.S. Cl. 424—314** **17 Claims**

**1**. A fluorinated alkenylene diamine derivative of the following Formula I:



Formula I

wherein:

$R_c$ represents hydrogen or —$COR_5$, where $R_5$ is as defined below;

$R_1$ represents hydrogen or $C_1$–$C_6$ alkyl;

one of $R_2$ and $R_3$ represents hydrogen and the other represents $C_1$–$C_6$ alkyl;

$R_5$ represents hydroxy or $C_1$–$C_8$ alkoxy; and

p represents 1 or 2

or a pharmaceutically acceptable salt thereof.

**16**. A pharmaceutical composition for inhibiting arnithine decarboxylase comprising a compound as defined in claim **1** as an active ingredient and a pharmaceutically acceptable carrier or diluent.

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**4,423,074**

## ALDOSE REDUCTASE INHIBITION BY 5-FLUORO-2-METHYL-1-[[4-(METHYLTHIO)PHENYL]-METHYLENE]-1H-INDENE-3-ACETIC ACID

**Dushan M. Dvornik, Mount Royal, and Nicole Simard-Duquesne, Montreal, both of Canada, assignors to Ayerst, McKenna & Harrison Inc., Montreal, Canada**

**Continuation-in-part of Ser. No. 160,873, Jun. 19, 1980, Pat. No. 4,307,114. This application Dec. 21, 1981, Ser. No. 332,566**

**The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.**

**Int. Cl.³ A61K *31/19***

**U.S. Cl. 424—317** **4 Claims**

**1**. A method of preventing or relieving a diabetic complication in a diabetic mammal which comprises administering to said mammal an effective alleviating or prophylactic amount of 5-fluoro-2-methyl-1-[[4-(methylthio)phenyl]methylene]-1H-indene-3-acetic acid, or a therapeutically acceptable salt thereof with an organic or inorganic base.

**4,423,075**

**ALDOSE REDUCTASE INHIBITION BY 5-FLUORO-2-METHYL-1-[[4-(METHYLSULFONYL)-PHENYL]METHYLENE]-1H-INDENE-3-ACETIC ACID**

**Dushan M. Dvornik, Town of Mount Royal, and Nicole Simard-Duquesne, Montreal, both of Canada, assignors to Ayerst, McKenna & Harrison Inc., Montreal, Canada**

**Continuation-in-part of Ser. No. 160,873, Jun. 19, 1980, Pat. No. 4,307,114. This application Dec. 21, 1981, Ser. No. 332,567**

**The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.**

**Int. Cl.³ A61K *31/19***

**U.S. Cl. 424—317** **4 Claims**

1. A method of preventing or relieving a diabetic complication in a diabetic mammal which comprises administering to said mammal an effective alleviating or prophylactic amount of 5-fluoro-2-methyl-1-[[4-(methylsulfonyl)phenyl]methylene]-1H-indene-3-acetic acid, or a therapeutically acceptable salt thereof with an organic or inorganic base.

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**4,423,076**

**1-BRANCHED-ALKYL-3-(2-HALOETHYL)-3-NITROSOUREAS AS NOVEL ANTITUMOR AGENTS**

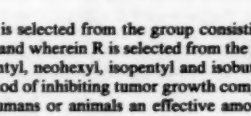
**Koloman Laki, Bethesda, Md., assignor to National Foundation for Cancer Research, Inc., Bethesda, Md.**

**Filed Aug. 8, 1979, Ser. No. 64,886**

**Int. Cl.³ C07C *127/15*; A61K *31/17***

**U.S. Cl. 424—322** **13 Claims**

1. A compound of the formula



wherein Hal is selected from the group consisting of fluorine and chlorine and wherein R is selected from the group consisting of neopentyl, neohexyl, isopentyl and isobutyl.

12. A method of inhibiting tumor growth comprising administering to humans or animals an effective amount of a compound of claim 1.

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**4,423,077**

**PERFLUOROCHEMICAL EMULSION ARTIFICIAL BLOOD**

**Henry A. Sloviter, Philadelphia, Pa., assignor to The University of Pennsylvania, Philadelphia, Pa.**

**Filed Jul. 27, 1982, Ser. No. 402,451**

**Int. Cl.³ A61K *31/13, 31/025***

**U.S. Cl. 424—325** **11 Claims**

1. A stable emulsion of perfluoro compound particles comprising about 30–75% (w/v) perfluoro compound, about 7–9% (w/v) of a non antigenic lipid which coats the perfluoro compound particles, and a physiologically acceptable aqueous medium.

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**4,423,078**

**PRODUCTION OF ORIENTAL-STYLE BREADING CRUMBS**

**Kenneth S. Darley, Whitby; David V. Dyson, Richmond Hill, and David J. Grimshaw, Thornhill, all of Canada, assignors to The Griffith Laboratories, Limited, Scarborough, Canada**

**Filed Apr. 14, 1982, Ser. No. 368,165**

**Int. Cl.³ A21D *2/00, 8/04, 2/08***

**U.S. Cl. 426—20** **30 Claims**

1. A method of forming oriental-style breading crumbs, which comprises the sequential steps of:

forming a leavened dough from bread-forming ingredients, including flour and water, and at least one leavening agent,

forming a tow of the leavened dough,

longitudinally stretching the dough tow to about 3 to about 8 times its initial length,

baking the stretched dough while maintaining the dough in stretched form, and

comminuting the baked dough to particulate form.

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**4,423,079**

**GROWTH PROMOTING COMPOSITIONS FOR *LACTOBACILLUS SANFRANCISCO* AND METHOD OF PREPARATION**

**Leo Kline, 1828 Mendocino St., Richmond, Calif. 94804**

**Continuation of Ser. No. 167,858, Jul. 14, 1980, abandoned. This application Aug. 16, 1982, Ser. No. 408,308**

**Int. Cl.³ A21D *2/34***

**U.S. Cl. 426—20** **19 Claims**

1. A method for making a composition useful for promoting growth of *Lactobacillus sanfrancisco* in bakery products comprising:

a. inoculating a water:flour culture with natural mother sponge or starter sponge containing strains of *L. sanfrancisco* and *Torulopsis holmii*,

b. developing said inoculated culture under conditions including controlled temperature which promotes growth of said microorganisms,

c. cooling said developed culture and holding it at the cooled temperature for a time sufficient to create a relatively high residual acidity, and

d. drying said culture by exposure to heat and air, substantially all viable *L. sanfrancisco* being destroyed during said drying.

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**4,423,080**

**CONTROLLED ATMOSPHERE PRODUCE PACKAGE**

**Karakian Bedrosian, Alpine, N.J., and Robert F. Schiffmann, New York, N.Y., assignors to Bedrosian and Associates, Alpine, N.J.**

**Continuation-in-part of Ser. No. 749,063, Dec. 9, 1976, Pat. No. 4,079,152, which is a continuation of Ser. No. 556,630, Mar. 10, 1975, abandoned. This application Mar. 6, 1978, Ser. No. 883,392**

**The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.**

**Int. Cl.³ B65B *25/04***

**U.S. Cl. 426—124** **8 Claims**

1. A package for the storage of produce comprising a sealed enclosure containing a quantity of produce, said produce being of any stage of maturity, a sealed packet within said sealed enclosure, a desiccant material within said sealed packet, a carbon dioxide absorbent within said sealed enclosure, said sealed packet being formed from a film which is permeable to water vapor, but which will retain any solution formed in said packet, said desiccant material being present in an amount sufficient to retard the formation of mold on the produce and to reduce the pressure within said sealed enclosure by the removal of water vapor from the atmosphere within said sealed enclosure for the desired period of storage, said carbon dioxide absorbent being present in a quantity sufficient to maintain the carbon dioxide content of the atmosphere within said sealed enclosure below the level which would cause carbon dioxide injury to the produce, and to reduce the pressure within said sealed enclosure by the removal of carbon dioxide from the atmosphere within said sealed enclosure for the desired period of storage, said sealed enclosure being constructed from a gas permeable film which permits additional oxygen to enter the enclosure in response to the reduced pressure created by said desiccant material and said carbon dioxide absorbent, the amount of said additional oxygen being sufficient to maintain the oxygen level of the atmosphere within said sealed enclosure at a level above the anaerobic respiration point of said produce, and below the point at which said produce experiences rapid ripening, the initial atmosphere within said sealed enclosure having been established by sealing the enclosure

from the outside ambieht atmosphere without modification of the ambient atmosphere within the enclosure, and the resulting atmosphere within said sealed enclosure being established and maintained by the respiration of the enclosed produce, the removal of carbon dioxide and water vapor from the atmosphere within said sealed enclosure, and the entry of additional oxygen into said sealed enclosure in response to reduced pressure within said sealed enclosure.

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**4,423,081**

## ACIDULATION OF MILK

**Michel Salmon, Sancerques, France, assignor to Laiteries Hubert Triballat, France**

**Continuation of Ser. No. 16,093, Feb. 28, 1979, abandoned. This application Nov. 18, 1980, Ser. No. 207,927**

**Claims priority, application France, Mar. 2, 1978, 78 06006**

**Int. Cl.³ A23C *9/146***

**U.S. Cl. 426—271** **4 Claims**

1. A process for the acidulation of milk having a starting normal pH value which comprises:

(a) suspending and stirring particles of a cationic exchange resin in its H form in the milk until the milk has a pH value which is lower than the starting pH value, but which is still higher than that at which flocculation of the milk takes place, then

(b) separating the particles from the milk with a sieve, and then

(c) adding to the milk an acid solution in an amount sufficient for flocculation of the milk to take place.

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**4,423,082**

## METHOD FOR MANUFACTURING QUICK COOKING PASTA PRODUCTS

**John Bauernfeind, Cherry Valley, N.Y.; Russell W. Carnahan, Evanston, Ill.; Norman Lodal, and Domingo Vazquez, both of Skokie, Ill., assignors to Kraft, Inc., Glenview, Ill.**

**Filed Nov. 23, 1981, Ser. No. 323,723**

**Int. Cl.³ A23L *1/16***

**U.S. Cl. 426—557** **14 Claims**

1. A method for preparing quick cooking pasta products comprising the steps of combining water, direct injection steam, and a dry cereal flour in a first extrusion cooking zone, mixing said combination under conditions of mechanical shear to provide a substantially fully gelatinized dough mixture having a water content in the range of about 25 to about 50 percent by weight of the total mixture, whereby said cereal dough mixture is rapidly heated above the atmospheric gelatinization temperatures of starches contained in the cereal composition to provide a homogeneous pasta dough;

maintaining the pasta dough at a temperature of 235° F. to 350° F. under pressure for a sufficient period of time in the range of about 15 to about 100 seconds to substantially completely gelatinize the starch component of the pasta composition;

introducing said dough into a cooling-forming extruder wherein the dough is cooled to a temperature in the range of about 130° F. to below the boiling temperature of water, and

extruding the dough from the cooling-forming extruder through a die to shape the same and continuously drying the pasta shapes at temperatures from 130° F. to 250° F. to rapidly reduce the moisture of the pasta products to from 6 to 13% by weight of the total weight of the product.

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**4,423,083**

## FABRICATED PROTEIN FIBER BUNDLES

**Soliman Y. K. Shenouda, Tarrytown, N.Y., assignor to General Foods Corp., White Plains, N.Y.**

**Continuation-in-part of Ser. No. 137,214, Apr. 4, 1980, abandoned. This application Sep. 3, 1981, Ser. No. 299,254**

**Int. Cl.³ A23J *3/00***

**U.S. Cl. 426—574** **15 Claims**

1. A process for preparing white, bland-tasting protein fiber bundles which are texturally and nutritionally similar to the meat flesh of mammals, poultry or seafood, said process comprising the steps of:

(a) preparing a mixture comprising heat coaguable protein which is water-soluble or partially water-soluble, a water-soluble alginate and water;

(b) cooling the mixture to unidirectionally freeze the water into elongated ice crystals and to separate the protein into well-defined, well-ordered, substantially independent fibers;

(c) slicing the solid mass of step (b) in a direction parallel to the longitudinal axis of the ice crystal formation to form fiber bundles, each slice having a predetermined thickness

(d) melting the ice crystals;

(e) gelling, via infusion of gelation ions, the water-soluble alginate in each fiber bundle to reinforce the well-defined, well-ordered, fiber-like structure wherein the rate of gelling the water-soluble alginate is at the same speed as the melting rate of ice crystals in the fiber bundles and wherein the thickness of each slice permits ion infusion into the solid mass such that the rate of gelling is at the same sped as the rate of melting;

(f) heating the resulting fiber bundles to coagulate the protein;

(g) treating the coagulated protein fiber bundles with an aqueous solution of a sequestering agent for texture modification and to extract undesirable salts contributing off-flavors; and

(h) separating the white, bland-tasting protein fiber bundles from the bath containing the sequestering agent.

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**4,423,084**

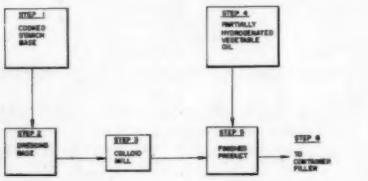
## PROCESS FOR PREPARING SALAD DRESSINGS

**Thomas M. Trainor, Danbury, Conn., and Daniel R. Sullivan, Fort Wayne, Ind., assignors to Central Soya Company, Inc., Fort Wayne, Ind.**

**Filed Nov. 25, 1981, Ser. No. 324,643**

**Int. Cl.³ A23L *1/24***

**U.S. Cl. 426—589** **1 Claim**




1. A process for preparing emulsified salad dressing and the like comprising:

(a) cooking to at least about 195° F. a starch base composed of starch and water and optionally salt, sugar and vinegar to form a starch paste, thereafter cooling said starch base to below about 100° F., said starch consituting from about 1% to about 8% of the final dressing weight,

(b) forming an aqueous mixture containing water and gum or gum equivalent and optionally spices, natural and artificial flavors and emulsifier-stabilizers, said gum or gum equivalent constituting from about 0.05% to about 1.0% of the final dressing weight, the water in said starch base and said aqueous mixture constituting from about 30% to about 70% of the final dressing weight,

(c) adding said starch base along with egg yolk or egg yolk equivalent to said aqueous mixture while continuing mixing, said egg yolk or egg yolk equivalent constituting from about 2% to about 10% of the final dressing weight,

(d) adding liquid vegetable oil having a temperature in the range of about 40° F. to about 55° F. and in an amount of about 5% to about 30% of the final dressing weight to the

mixture of said starch paste and said another mixture while continuing mixing to form a loose emulsion having a temperature of about 60° F. to about 90° F.,

(e) colloid milling said loose emulsion to form a colloid-milled base,

(f) mixing into said colloid-milled base a partially hydrogenated oil having a temperature of about 115° F. to about 130° F. and in an amount up to about 20% of the final dressing weight, and

(g) after mixing to form a uniform composition, filling said uniform composition into containers to provide dressing having a viscosity in the range of about 50,000 to about 250,000 cps and effective to withstand at least 10 freeze-thaw and mechanical stress cycles, each cycle consisting of holding a sample in a freezer for 72 hours, thereafter storing the sample at a temperature of 65°–75° F. for five hours, rapidly stirring the sample with 25 strokes of a standard four tine kitchen fork, holding the sample at about 75° F. for one hour and inspecting the sample for the presence of free water.

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**4,423,085**

## COCRYSTALLIZED SUGAR-NUT PRODUCT

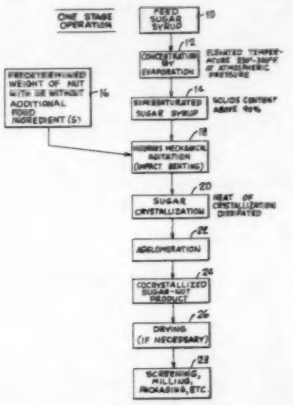
**Andy C. C. Chen, Belle Mead; Anthony B. Rizzuto, Hackettstown, and Martin F. Veiga, Wallington, all of N.J., assignors to Amstar Corporation, New York, N.Y.**

**Filed Apr. 23, 1982, Ser. No. 371,266**

**The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.**

**Int. Cl.³ A23L *1/36, 1/38;* C13F *3/00***

**U.S. Cl. 426—632** **37 Claims**




1. A method for preparing a cocrystallized sugar-nut product comprising:

(a) concentrating a sugar syrup at atmospheric pressure or under vacuum at a temperature in the range of about 250° F. to about 300° F. to a solids content in excess of about 90% by weight;

(b) directly admixing the concentrated sugar syrup at a temperature not less than about 240° F. to about 300° F. at atmospheric pressure with nuts or finely divided nuts to form a mixture;

(c) subjecting the resulting mixture to impact beating within a crystallization zone until a cocrystallized sugar-nut product is formed comprising nuts and crystalline sugar, the crystalline sugar of said product being made up of aggregates of fondant-size sugar crystals, and the product having a moisture content of less than about 2.5% by weight; and

(d) recovering the cocrystallized sugar-nut product from the crystallization zone.

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**4,423,086**

## PROCESS FOR HARD COATING WITH SORBITOL AND PRODUCTS OBTAINED THEREBY

**Francis Devos, Morbecque-Merville; Guy Bundere, La Gorgue, and Michel Huchette, Merville, all of France, assignors to Roquette Freres, Lestrem, France**

**PCT No. PCT/FR80/00151, § 371 Date Jun. 16, 1981, § 102(e) Date Jun. 16, 1981, PCT Pub. No. WO81/01100, PCT Pub. Date Apr. 30, 1981**

**PCT Filed Oct. 16, 1980, Ser. No. 276,361**

**Claims priority, application France, Oct. 17, 1979, 79 25840; Switzerland, Apr. 3, 1980, 2652/80**

**Int. Cl.³ G01K *9/32***

**U.S. Cl. 427—3** **22 Claims**

1. Process for hard coating with sorbitol of cores of confectionery and pharmaceutical products, comprising:

applying the sorbitol by addition, on a moving bed of cores to be coated, of a syrup having a concentration of dry matter comprised between 60 and 85% by weight and a richness in D-sorbitol higher than 80%,

maintaining the temperature existing in the moving bed of cores to be coated at a value below 55° C.,

selecting these conditions within the limits indicated in such a way that, when the sorbitol syrup arrives in contact with the cores to be coated, that is to say at the temperature maintained in the moving bed, the said sorbitol is at a saturation level comprised between 0.65 and 1.25.

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**4,423,087**

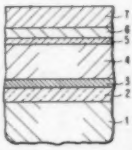
## THIN FILM CAPACITOR WITH A DUAL BOTTOM ELECTRODE STRUCTURE

**James K. Howard, Fishkill, and Kris V. Srikrishnan, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 28, 1981, Ser. No. 335,136**

**Int. Cl.³ H01G *1/01, 4/12, 4/08***

**U.S. Cl. 427—79** **3 Claims**




1. A method for forming a thin film capacitor comprising the steps of:

depositing on a substrate a first layer of metal selected from the group consisting of hafnium, zirconium, and tantalum,

depositing a second layer of platinum on said first layer,

depositing a dielectric layer on said second layer, and

forming a counter electrode.

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**4,423,088**

## METHOD FOR DEPOSITING ASPHALT

**Peter E. Graf, Orinda, and Judson E. Goodrich, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.**

**Continuation of Ser. No. 22,762, Mar. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 820,261, Aug. 1, 1977, abandoned, which is a continuation-in-part of Ser. No. 732,849, Oct. 18, 1976, abandoned. This application Aug. 14, 1980, Ser. No. 178,056**

**Int. Cl.³ B05D *5/10;* E01C *5/12***

**U.S. Cl. 427—138** **5 Claims**

1. A method for depositing asphalt from an asphalt emulsion onto an aggregate, that comprises wetting down the aggregate with water containing between about 0.01 weight percent and

about 1.0 weight percent of coupling agent selected to have charge opposite to the charge of said asphalt emulsion and applying said asphalt emulsion to the wetted aggregate.

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**4,423,089**

**SUBBING PROCESS FOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS**

**Masayoshi Sekiya, Tokyo; Masao Yabe, Fujinomiya; Tamotsu Suzuki, Fujinomiya; Takeji Ochiai, Fujinomiya, and Sumitaka Tatsuta, Fujinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa and Nippon Zeon Co., Ltd., Tokyo, both of, Japan**

**Filed May 15, 1981, Ser. No. 264,155**

**Claims priority, application Japan, May 15, 1980, 55-64739**

**Int. Cl.³ B05C *3/107;* B05D *3/02***

**U.S. Cl. 427—171** **17 Claims**

1. A subbing process for a photographic light-sensitive material comprising applying a polymer latex to a plastic film base, wherein said polymer is a copolymer composed of (1) a diolefin monomer, (2) at least one monovinyl monomer, and (3) at least one monomer having two or more vinyl groups, acryloyl groups, methacryloyl groups, or allyl groups excepting the diolefin monomer, and having a gel fraction of the polymer in the latex from 50% to 95% by weight, wherein said plastic film base is biaxially stretched and wherein said polymer latex is applied in solution on the plastic film base and dried at a temperature of from 120° C. to 200° C. from 30 seconds to 10 minutes.

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**4,423,090**

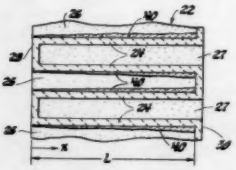
**METHOD OF MAKING WALL-FLOW MONOLITH FILTER**

**Dean C. Hammond, Jr., Birmingham, and Paul T. Vickers, Bloomfield Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Division of Ser. No. 345,005, Feb. 2, 1982, Pat. No. 4,390,355. This application Jan. 6, 1983, Ser. No. 455,926**

**Int. Cl.³ B05D *7/22***

**U.S. Cl. 427—181** **2 Claims**




1. A method of making a particulate filter trap with a configuration for more uniform trapping of particulates, said method including the steps of placing a ceramic monolith filter trap, of the type having interlaced porous internal walls defining parallel, constant area, inlet and outlet channels in a fluid stream consisting of a suspension of ceramic powder dispersed in a carrier fluid so that said carrier fluid carries said ceramic powder into said inlet channels whereby said ceramic powder will be trapped by and accumulate along the inlet channel walls according to the axial distribution of transverse velocity of said carrier fluid flowing through said inlet channels and the walls defining the same to thereby increase the inlet channel wall thickness and to decrease the inlet channel area with increasing X/L wherein:

L=total length of an inlet channel, and,

X=distance from inlet end of an inlet channel; removing said ceramic filter trap from said fluid stream after a predetermined amount of ceramic powder has accumulated in said inlet channels; and, firing said ceramic monolith filter trap with said accumulated ceramic powder therein to effect fusion of said ceramic powder to said inlet channel walls.

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**4,423,091**

**METHOD OF MAKING MICROCAPSULES**

**Hiroshi Iwasaki; Shinsuke Irii, and Haruo Omura, all of Hyogo, Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan**

**Filed Dec. 7, 1981, Ser. No. 328,175**

**Claims priority, application Japan, Dec. 13, 1980, 55-176297**

**Int. Cl.³ B05D *7/24;* B01J *13/02***

**U.S. Cl. 427—213.34** **6 Claims**

1. A method of making microcapsules comprising performing polycondensation for producing aminoaldehyde resin in an aqueous dispersion including particles of hydrophobic core material in the presence of cation-modified polyvinyl alcohol to form aminoaldehyde resin microcapsule walls around said particles of hydrophobic core material, said cation-modified polyvinyl alcohol present in an amount of 0.1 to 20% by weight of said aqueous dispersion and in the form of an aqueous solution.

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**4,423,092**

**LUBRICATING COMPOSITIONS FOR ORGANIC FIBERS**

**Karl Huhn; Helga Lampelzammer, and Wolfgang Kaiser, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany**

**Filed Dec. 9, 1981, Ser. No. 328,976**

**Claims priority, application Fed. Rep. of Germany, Jan. 13, 1981, 3100803**

**Int. Cl.³ B05D *3/02***

**U.S. Cl. 427—316** **5 Claims**

1. A composition to improve the slip properties of organic fibers which comprises at least one organosilicon compound of the formula

$$M_aR_bSi\{[(OSiR_2)_xD]_m(OSiR_2)_xOSiR_{3-a}M_a\}_{4-a-b}$$

where R is selected from the group consisting of hydrocarbon radicals and substituted hydrocarbon radicals having from 1 to 10 carbon atoms, D is a radical of the formula

$$-X_a-ArX_a(ArX_a)_c-$$

where X is selected from the group consisting of

$$-\overset{O}{\overset{\|}{C}}-,$$

$$-NR'-,\ -O-,\ -S-,\ -SO_2-,\ -R''-,\ -NR'R''-,$$

$$-\overset{O}{\overset{\|}{C}}R''-,$$

—OR"—, —SR"—, and $-SO_2R''-$, R' is hydrogen or R, R" is a bivalent aliphatic hydrocarbon radical having from 1 to 8 carbon atoms, Ar is selected from the group consisting of a bivalent aromatic hydrocarbon radical and a substituted bivalent aromatic hydrocarbon radical, M is a radical of the formula

$$X_aArX_a(ArX_a)_cH,$$

a is 0 or 1, b is 0, 1 or 2, c is 0 or a number of from 1 to 5, m is 0 or an integer having a value of from 1 to 20 and x is 0 or an integer having a value of from 1 to 1000, with the proviso that at least one $OSiR_2$ unit and at least one $-X_aArX_aAr-$ group is present per molecule and at least one compound selected from the group consisting of a phosphorus compound

of the formula $O{=}P[(OCHR^1CHR^1)_nOR^2]_3$ and a mixture of the phosphorus compound and an ammonium compound of the formula $NR_4^{2+}x^-$, where $R^1$ is selected from the group consisting of hydrogen and a methyl group, with the proviso that in each $—OCHR^1CHR^1$ unit at least one $R^1$ is hydrogen, $R^2$ is selected from the group consisting of hydrogen and a monovalent hydrocarbon radical having from 1 to 20 carbon atoms, with the proviso that in each ammonium compound having the formula $NR_4^{2+}x^-$, at least two of the $R^2$ radicals are hydrocarbon radicals and n represents 0 or an integer of from 1 to 15, with the proviso that when $R^2$ is hydrogen in the phosphorus compound, n must be at least 1 and at least one $—OCHR^1CHR^1$ unit must be present in the phosphorus compound and $x^-$ represents an anion selected from the group consisting of an organic and inorganic acid.

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**4,423,093**

## METHOD OF APPLYING POLYARYLENE SULPHIDE COMPOSITIONS TO A BEARING

**Glyndwr J. Davies, Middlesex, England, assignor to The Glacier Metal Company Limited, Middlesex, England**

**PCT No. PCT/GB81/00129, § 371 Date Mar. 3, 1982, § 102(e) Date Mar. 3, 1982, PCT Pub. No. WO82/00182, PCT Pub. Date Jan. 21, 1982**

**PCT Filed Jul. 3, 1981, Ser. No. 353,737**

**Claims priority, application United Kingdom, Jul. 4, 1980, 8022064**

**Int. Cl.³ B05D *3/02***

**U.S. Cl. 427—385.5** **8 Claims**

1. A method of applying a coating of polyarylene sulphide to a bearing which comprises:

applying a mixture of polyarylene sulphide and an aryl ester of an aryl alcohol to the surface of a bearing blank; and

subsequently heating said mixture to evaporate said ester and to cure said coating.

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**4,423,094**

## DURABLE CAST EPOXY TOOLING COMPOSITION

**Thomas J. Dearlove, Troy; Richard K. Gray, Warren, and Richard P. Atkins, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Nov. 12, 1982, Ser. No. 440,976**

**Int. Cl.³ B05D *3/02***

**U.S. Cl. 427—386** **2 Claims**

1. A method of providing a wear resistant surface on a tool for deforming sheet metal comprising coating at least the working surface of a said tool with a mixture comprising a liquid epoxy novolac resin having an epoxide functionality greater than two, a liquid aliphatic epoxy resin having a lower viscosity than said epoxy novolac resin, a particulate filler having a microhardness substantially equal to or greater than the microhardness of silicon carbide, an aliphatic amine curing agent for said epoxy resins that is active at room temperature, and an imidazole curing agent for said epoxy resins that is first active at a temperature above the peak exotherm generated in the mixture by the activity of the aliphatic amine curing agent; allowing said coated mixture to stand at room temperature until it hardens; and thereafter heating said hardened coated mixture to an elevated temperature whereat the imidazole curing agent is active to further cross link the epoxy constituents and increase the toughness of the mixture.

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**4,423,095**

## SILICONE-ORGANIC COATING COMPOSITIONS

**John D. Blizzard, Bay City, Mich., assignor to Dow Corning Corporation, Midland, Mich.**

**Filed Jan. 28, 1983, Ser. No. 461,814**

**Int. Cl.³ A23F *3/00***

**U.S. Cl. 427—387** **20 Claims**

1. A composition consisting essentially of a homogeneous mixture of

(I) a liquid silicone resin prepared by

(A) forming a homogeneous mixture having an acid number greater than zero and consisting essentially of

(a) an organic solvent solution of a resinous copolymeric siloxane containing silicon-bonded hydroxyl radicals and consisting essentially of $R_3SiO_{1/2}$ siloxane units and $SiO_{4/2}$ siloxane units wherein the ratio of the number of said $R_3SiO_{1/2}$ siloxane units to the number of said $SiO_{4/2}$ siloxane units has a value of from 0.6/1 to 0.9/1 and each R denotes, independently, a monovalent hydrocarbon radical and

(b) a liquid organohydrogenpolysiloxane wherein each organic radical is, independently, a monovalent hydrocarbon radical, there being an average of at least one,silicon-bonded hydrogen radical per molecule of said organohydrogenpolysiloxane, and

(B) heating the homogeneous mixture of (A) to remove substantially all of said organic solvent therefrom,

(II) one or more silicon-free, film-forming organic polymers, and

(III) a compatibilizing liquid in at least a sufficient amount to render the composition homogeneous; the weight ratio of the amount of component (I) to the amount of component (II) having a value of from 1/99 to 99/1.

14. A method for coating a substrate, said method comprising

(1) applying to said substrate a composition consisting essentially of

(I) a liquid silicone resin prepared by

(A) forming a homogeneous mixture having an acid number greater than zero and consisting essentially of

(a) an organic solvent solution of a resinous copolymeric siloxane containing silicon-bonded hydroxyl radicals and consisting essentially of $R_3SiO_{1/2}$ siloxane units and $SiO_{4/2}$ siloxane units wherein the ratio of the number of said $R_3SiO_{1/2}$ siloxane units to the number of said $SiO_{4/2}$ siloxane units has a value of from 0.6/1 to 0.9/1 and each R denotes, independently, a monovalent hydrocarbon radical and

(b) a liquid organohydrogenpolysiloxane wherein each organic radical is, independently, a monovalent hydrocarbon radical, there being an average of at least one silicon-bonded hydrogen radical per molecule of said organohydrogenpolysiloxane, and

(B) heating the homogeneous mixture of (A) to remove substantially all of said organic solvent therefrom,

(II) one or more silicon-free, film-forming organic polymers,

(III) a compatibilizing liquid in at least a sufficient amount to render the composition homogeneous; the weight ratio of the amount of component (I) to the amount of component (II) having a value of from 1/99 to 99/1, and optionally,

(IV) a curing catalyst in sufficient amount to improve the curing rate of the coating, and

(2) evaporating the compatibilizing liquid from the applied composition.

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**4,423,096**

## METHOD FOR PROTECTING POROUS CERAMIC BUILDING MATERIALS EXPOSED TO WEATHERING

**David E. Jackson, Glen Ellyn, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.**

**Filed Nov. 3, 1982, Ser. No. 438,992**

**Int. Cl.³ B05D *5/00***

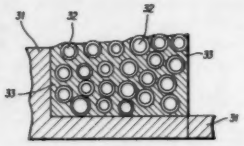
**U.S. Cl. 427—397.7** **2 Claims**

1. A method of protecting porous ceramic building materials such as brickwork, stone, and mortar exposed to weathering which comprises coating the exposed surfaces of such porous ceramics with a composition comprising an aqueous silica sol having suspended therethroughout a finely divided granular ceramic powder.

## 4,423,097
## ABRADABLE SEAL AND ITS METHOD OF PRODUCTION

Claude M. Mons, Savigny Le Temple; Michel J. Pernot, Fontenay Sous Bois, and Roland R. Spinat, Bretigny Sur Orge, all of France, assignors to Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation "S.N.E.C.M.A.", Paris, France

Filed Jun. 14, 1982, Ser. No. 387,818
Claims priority, application France, Jun. 12, 1981, 81 11564
Int. Cl.³ B05D 1/10
U.S. Cl. 427—423 13 Claims




1. A method for producing a seal consisting of a dispersion of hollow microspheres in a binder and fixed to a support, said method comprising:

forming a mixture of binder material powder and hollow microspheres made of an uncoated inorganic refractory material, said binder powder being fusable at a temperature lower than the melting temperature of said microspheres;

transporting said mixture to a spraying torch; and

using said torch to heat and project said mixture onto said support such that said binder powder is fused and bonded to said microspheres and said support, and such that said microspheres are not substantially deformed and fragmented.

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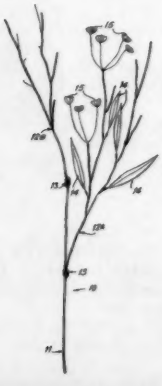
## 4,423,098
## CONNECTORS FOR ASSEMBLING COMPONENT PARTS OF ARTIFICIAL PLANTS

Henry Weitz, Prosperity House, 11th Floor, 8A-10 Granville Rd., Kowloon, Hong Kong

Filed Jan. 17, 1983, Ser. No. 458,303
Int. Cl.³ A41G 1/00; A47G 7/00
U.S. Cl. 428—17 4 Claims




1. An artificial plant comprising an elongated main stem member; a plurality of similar, separately formed auxiliary stem assemblies having respective end portions to be secured to portions of said main stem member at respective locations spaced apart along the latter; and connectors securing said end portions of the auxiliary stem assemblies to said portions of the main stem member at said respective locations and each consisting of a strip of malleable sheet metal wrapped about the respective portion of said main stem member and the respective end portion of an auxiliary stem assembly and having tapering end portions which overlap in side-by-side relation to an extent depending on the thicknesses of said portion of the main stem member and said respective end portion of an auxiliary stem assembly secured together thereby.

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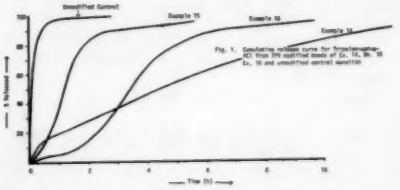
## 4,423,099
## MEMBRANE MODIFIED HYDROGELS

Karl F. Mueller, New York, and Sonia J. Heiber, Bedford Hills, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 28, 1980, Ser. No. 172,908
Int. Cl.³ B32B 11/20
U.S. Cl. 428—35 20 Claims


Unmodified Control
Example 7F
Example 1E
Example 1A
Fig. 1. Cumulative release curve for Triamterene-HCl from IPN modified beads of Ex. 1A, Ex. 1E Ex. 1F and unmodified control specimen
% Released
Time (h)

1. A non-uniform substantially water-insoluble interpenetrating polymer blend composition comprising a water swellable first polymer substrate interpenetrated in a gradient substantially normal to the substrate surface by a less permeable condensation second polymer to form a diffusion rate controlling membrane therein.

10. A composition according to claim 1, which is in the form of a sheet, tube or pouch.

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## 4,423,100
## DIFFERENTIALLY ADHERING RELEASE COATINGS FOR VINYL CHLORIDE-CONTAINING COMPOSITIONS

Jack H. Witman, East Hempfield Township, Westmoreland County, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Jun. 28, 1982, Ser. No. 392,646
Int. Cl.³ B65B 33/00; B32B 23/08, 27/10
U.S. Cl. 428—42 34 Claims

1. A process for preparing a fused vinyl chloride-containing structure, said process comprising the steps of

providing a carrier with a releasable coating film, said film comprising

(a) at least one cellulosic ether or cellulosic ester having a melting point not less than about 220° F., and

(b) at least one adhesion-promoting compound having an affinity for polymeric vinyl chloride-containing compositions,

adhering a polymeric vinyl chloride-containing composition to the coated carrier,

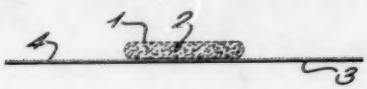
selectively processing and fusing the composite structure, and

separating said carrier from the resulting fused polyvinyl chloride-containing composition, said coating film securely bonding said carrier to said composite structure during processing, but substantially losing its bonding capability when said composite structure is fused.

## 4,423,101
## ABSORBENT PRODUCTS

Donald A. Willstead, Southampton, England, assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Oct. 13, 1981, Ser. No. 310,547
Int. Cl.³ A61L 15/00, 15/01
U.S. Cl. 428—76 6 Claims



1. An absorbent product comprising an absorbent material for retaining absorbed fluid at least partially faced by a cellular plastic film having perforations which have been produced by passing electrical discharges therethrough, said film having at least the following characteristics:

(a) it comprises no more than 14% by volume of the film of closed cells;

(b) it has an apparent density which is 90 to 20% of the density of a non-cellular unstretched composition;

(c) it has a cell factor equal to or less than +0.65, which factor may be zero or negative;

(d) it contains from 0 to 25% by weight based on the polyolefin of the filler and/or pigment;

(e) it has a thickness of up to 11 mils;

(f) it comprises cells with dimensions such that the average cell volume is no greater than $10^{-4}$ cc;

(g) it has been stretched in the plane of the film by an amount corresponding to a stretch ratio of at least 1.1:1 in one direction or in two substantially mutually perpendicular directions;

said perforated film being pitted and oxidized by the electrical discharges, and the pitted and oxidized side of the film facing said absorbent material.

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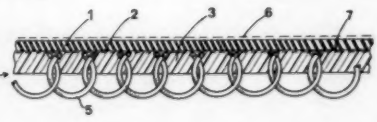
## 4,423,102
## COVERING STRUCTURE FOR SEATING OR THE LIKE

Jean-Louis Danton, Boulogne, France, assignor to Etablissements M. Duret & Fils, France

Continuation-in-part of Ser. No. 16,341, Feb. 27, 1979, abandoned. This application May 11, 1982, Ser. No. 376,948
Int. Cl.³ B32B 3/10, 5/18, 5/24, 7/04
U.S. Cl. 428—92 13 Claims



1. Covering structure resisting laceration, especially for seating or the like, comprising:

(a) a covering layer of a dense plastic material, relatively thick, presenting little elasticity in its plane but good flexibility;

(b) a network formed by a continuous layer of spiral metallic springs whose axes are parallel to the covering layer of dense plastic material, and whose spirals are intertwined with each other so as to obtain, seen in plane view, a structure in the form of a meshed checkerboard, the spirals of said springs on one side being substantially flush against the lower face of the covering layer; and,

(c) a foamed plastic material layer with a thickness less than the diameter of the spiral metallic springs layer, said foamed plastic material layer adhering on one side to a lower face of the dense plastic material layer with the spiral metallic springs layer being partially embedded in said foamed plastic material layer.

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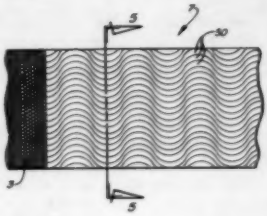
## 4,423,103
## PATTERNIZED COATING

John Bogdany, Fort Oglethorpe, Ga., assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Jun. 6, 1983, Ser. No. 501,580
Int. Cl.³ B32B 3/30, 5/20
U.S. Cl. 428—95 12 Claims



9. A carpet having a resilient foam underlay adhered to the back of said carpet and comprising a plurality of parallel, serpentine rows of a cured cellular organic polymeric composition.

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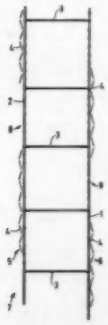
## 4,423,104
## WIDE-BAND CAMOUFLAGE NETTING

Günter Pusch, Bannholzweg 12, 6903-Neckargemund-2; Dieter Aisslinger, Heidestr. 54, 6222-Geisenheim, and Alexander Hoffmann, Schlosstr. 32, 6909-Rotenberg, all of Fed. Rep. of Germany

Filed Oct. 27, 1980, Ser. No. 201,370
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1979, 2943430
Int. Cl.³ B32B 3/06
U.S. Cl. 428—101 9 Claims



1. A camouflage net comprising two or more layers of a carrier net with garnishing stretch fabric materials spread out on said layers and so affixed on each of said layers as to effectively overlap at least partially from one of said layers to the other thus preventing any radiation perpendicular to said layers from penetrating said net with the average spacing of the layers held together by tapes or cords, the length of which defines the spacing between said layers.

**4,423,105**

## ARTICLE FOR CLOTHES CONDITIONING AND METHOD OF MAKING SAME

**Alan Dillarstone, Rocourt, and Genevieve B. Deistnache, Loncin-Ans, both of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.**

**Filed Aug. 2, 1982, Ser. No. 404,025**
**Int. Cl.³ B32B** *7/14, 27/02, 27/06*
**U.S. Cl. 428—198** **10 Claims**

**1.** A laundry conditioning product comprising a substrate of a non-woven hydrophobic thermoplastic having a water absorption capacity of less than 400% and being impregnated with a clothes conditioning composition, there being a weight ratio of conditioning composition to substrate of between 2:1 to 0.5:1, said substrate including a plurality of sheets arranged in a butterfly configuration with the edges thereof being free from each other, said sheets being bonded to each other along a substantially centrally located line forming a spine for said butterfly configuration of sheets.

**9.** A method for making the product of claim **1**, which comprises impregnating the substrate sheets with a paste of the conditioning composition, assembling a plurality of said sheets into a butterfly configuration, and bonding the assembly in a unitary structure along a substantially centrally located spine.

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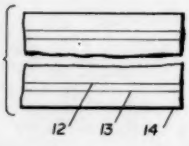
**4,423,106**

## LAMINATED MATERIAL AND METHOD OF FORMING

**John E. Mahn, 5688 Woodhaven Dr., Cincinnati, Ohio 45211**

**Continuation of Ser. No. 172,818, Jul. 28, 1980, abandoned, which is a division of Ser. No. 6,750, Jan. 26, 1979, Pat. No. 4,269,885. This application Apr. 23, 1982, Ser. No. 371,202**
**The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.**
**Int. Cl.³ B32B** *3/00, 7/02;* **B29C** *19/00*
**U.S. Cl. 428—207** **23 Claims**




**1.** A combination comprising a laminate of two layers, at least one layer of which contains a polyurethane and one layer includes a polyester, one of said layers being directly adhered to a fabric, said polyester being amorphous and said laminate prior to being adhered to said fabric being non-curling.

**3.** A combination according to claim **1** wherein both the polyurethane and the polyester are thermoplastic.

**10.** A combination according to claim **3** wherein one of said layers has printing thereon.

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**4,423,107**

**Patent Not Issued For This Number**

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**4,423,108**

## METHOD FOR DURABLE PRESS FINISH USING FORMALDEHYDE-FREE ORGANOSILICON COMPOSITIONS AND TEXTILE THEREFROM

**Robert E. Kalinowski, Auburn, and Gary A. Vincent, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.**

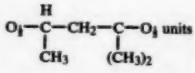
**Filed Mar. 22, 1982, Ser. No. 360,137**
**Int. Cl.³ D06M** *13/18, 15/30*
**U.S. Cl. 428—266** **10 Claims**

**1.** A method for imparting durable press characteristics to a cellulosic fiber containing textile fabric, said method comprising:

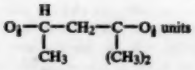
(a) impregnating the textile fabric with a homogeneous composition comprising a volatile liquid carrier and a fluid organosilicon polymer selected from the group consisting of

(i) polymers consisting of $(CH_3O)_xC_6H_5SiO_{(3-x)/2}$ units and $(CH_3O)_y(CH_3)_2SiO_{(2-y)/2}$ units wherein x has a value of 2, 1 or 0, y has a value of 1 or 0, the sum of x+y has a value greater than 0, and the molar ratio of $(CH_3O)_xC_6H_5SiO_{(3-x)/2}$ units to $(CH_3O)_y(CH_3)_2SiO_{(2-y)/2}$ units has a value of from 1:4 to 1:40 and

(ii) polymers consisting of $(CH_3O)_xC_6H_5SiO_{(3-x)/2}$ units, $(CH_3O)_zCH_3SiO_{(3-z)/2}$ units, and




wherein x has a value of 2, 1 or 0, z has a value of 2, 1 or 0, the sum of x+z has a value greater than 0, the molar ratio of $(CH_3O)_xC_6H_5SiO_{(3-x)/2}$ units to $(CH_3O)_zCH_3SiO_{(3-z)/2}$ units has a value from 1:0.5 to 1:4, and the molar ratio of $(CH_3O)_xC_6H_5SiO_{(3-x)/2}$ units to




has a value of from 1:0.85 to 1:3.5; and

(b) heating the impregnated textile fabric of (a) to crosslink the fluid organosilicon polymer.

**8.** A durable press textile fabric produced by the method of claim **1**, **2** or **3**.

## 4,423,109
## FIBER REINFORCED RUBBER GASKET MATERIAL

Norman L. Greenman, Woodstock; Richard C. Berry, Danielson; Douglas H. Tracy, Putnam; Bruce M. Arnio, Danielson; Michael S. Lunt, Abington, and Jeffrey B. Otto, Brooklyn, all of Conn., assignors to Rogers Corporation, Rogers, Conn.

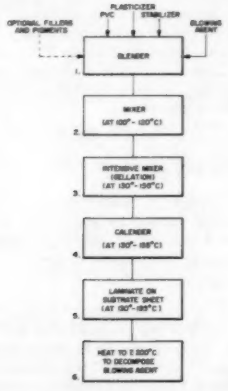
Filed Oct. 2, 1981, Ser. No. 307,653
Int. Cl.³ D04H 1/58
U.S. Cl. 428—288 18 Claims

1. A fiber reinforced gasket material comprising:
70% to 90% by weight of a composition comprising:
10% to 80% elastomeric binder;
10% to 80% inorganic particulate filler;
2% to 20% compounding agents; and
10% to 30% by weight of a nonwoven fabric of organic fibers selected from the group consisting of cellulose, polyolefin, polyamide, polyimide, polyester and polyacrylic fibers;
said fabric being impregnated with said composition to constitute a fiber reinforced gasket material.

## 4,423,110
## PROCESS FOR FORMING OPEN CELL SHEET, SHEET FORMED BY PROCESS, INTERMEDIATE FOR FORMING SAID SHEET AND PROCESS FOR FORMING SAID INTERMEDIATE

Akira Sato, Tsuchiura, Japan, assignor to Lonseal Kogyo Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1980, Ser. No. 134,535
Claims priority, application Japan, Mar. 27, 1979, 54-36509
Int. Cl.³ B29D 27/00; B32B 5/18
U.S. Cl. 428—304.4 22 Claims




1. A process for producing an open-cell foam sheet, said process comprising the steps of:
(a) mixing a polyvinyl chloride plastisol; at least one stabilizer containing a Group I metal selected from the group consisting of sodium, potassium, lithium, or mixtures thereof and further comprising zinc; and a blowing agent to form a blend;
(b) mixing said blend at a temperature greater than ambient but lower than gelling temperature to convert said blend to a granular state;
(c) intensively mixing the product of step (b) at gelling temperature to form a gel;
(d) forming the gelled blend of step (c) into a sheet; and
(e) heating said sheet to decompose said blowing agent, thereby forming said open-cell foam.

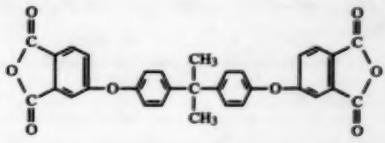
18. The process as defined in claim 1 wherein step (b) is performed at a temperature between 100° C. and 120° C., and step (c) is performed at a temperature of 130° C. to 155° C.

## 4,423,111
## POLYETHERIMIDE RESIN AND ELECTRICAL CONDUCTORS INSULATED THEREWITH

Yue-Gucy L. Lee, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 137,991, Apr. 7, 1980, abandoned. This application Mar. 20, 1981, Ser. No. 246,046
Int. Cl.³ C08G 18/30; B32B 27/00; D02G 3/00
U.S. Cl. 428—383 7 Claims

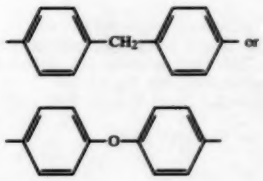
1. An electrical conductor having an insulating resin coating thereon, said coating consisting of a base coat of a polyester or polyesterimide and an overcoat of a resin prepared by subjecting a dianhydride of the formula



or a mixture thereof with at least one other dianhydride of a tetracarboxylic acid, and 0.99 to 1.01 moles, per mole of the dianhydride, of an organic diisocyanate compound of the formula

$$O{=}C{=}N{-}R{-}N{=}N{=}C{=}O$$

wherein R is divalent alkylene radical of 2 to 20 carbon atoms,




to polycondensation at a temperature of about 60° to 200° C. in the presence of an inert solvent.

## 4,423,112
## IMPREGNATING AGENT FOR MATERIALS CONTAINING CELLULOSE

Bruno Luthringshauser, St. Augustin, and Claus Lindzus, Cologne, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Dec. 8, 1980, Ser. No. 214,593
Int. Cl.³ B27K 3/16; C09K 3/00
U.S. Cl. 428—389 25 Claims

1. An impregnating agent for a cellulose article comprising
(a) An alkyltrialkoxysilane of the formula R $Si(OR')_3$, in which R represents an alkyl moiety of 1 to 18 carbon atoms and R' and alkyl moiety of 1 to 4 carbon atoms, and
(b) A chelate of a metal of the third main group or fourth or

fifth secondary group of the periodic system of the elements, wherein component (a) is present in the mixture in an amount between 5 and 99.5% by-weight and component (b) is present in said mixture in an amount between 0.5 and 95 wt.-%, said alkyltrialkoxysilane and said chelate being present in amounts effective to produce an impregnating agent which has a waterproofing action on cellulose.

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4,423,113

## ZIRCONIUM OXIDE COATED NYLON FIBERS

Salvador Olive, and Gisela Olive, both of Cantonment, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 22, 1982, Ser. No. 360,714
Int. Cl.³ D02G 3/00
U.S. Cl. 428—389 4 Claims

1. A nylon fiber coated with a composition consisting essentially of the reaction product of polymeric zirconium oxide and a hydroxycarboxylic acid or salt thereof.

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4,423,114

## MAGNETIC POWDER FOR MAGNETIC RECORDING MEDIUM

Hiroto Saguchi; Masashi Hayama, and Keitaro Sakai, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,551
Claims priority, application Japan, Sep. 11, 1980, 55-126200
Int. Cl.³ C01G 49/06
U.S. Cl. 428—403 1 Claim

1. A magnetic powder for a magnetic recording medium which is a cobalt-adsorbed magnetic iron oxide comprising $\gamma$-$Fe_2O_3$, having a coercive force of at least 1000 Oe and a ratio of a coercive force at −196° C. to a coercive force at room temperature of 3 or less, which magnetic powder is obtained by coating said $\gamma$-$Fe_2O_3$ in dispersion with a cobalt component by adding cobalt ion to $\gamma$-$Fe_2O_3$ at a ratio of 6 wt. % or more, and then adding ferrous ion at a ratio of 20 wt. % or more as $Fe^{2+}$ based on $\gamma$-$Fe_2O_3$ and at a ratio of said ferrous salt to said cobalt salt of 3.0 to 4.5 by weight so as to adsorb $Fe^{2+}$ and $Co^{2+}$ in a $Fe^{2+}/Co^{2+}$ weight ratio of 2.0 to 3.5.

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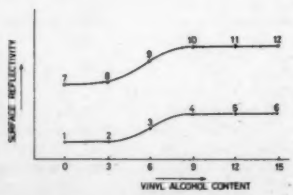
4,423,115

## MAGNETIC RECORDING MEDIUM

Fuminori Tokuda, and Yutaka Nakashima, both of Komoro, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,385
Claims priority, application Japan, Oct. 23, 1981, 56-168727; Oct. 23, 1981, 56-168728
Int. Cl.³ H01F 10/02
U.S. Cl. 428—425.9 6 Claims




1. A magnetic recording medium comprising a base and a magnetic coating material applied thereon, said coating being made of a binder which consists of a polyurethane resin having a metal sulfonate group, a vinyl chloride-vinyl acetate copolymer containing not less than 8% vinyl alcohol on the basis of the total copolymer weight, and nitrocellulose, and magnetic particles dispersed in said binder.

4,423,116

## REUSABLE PROJECTION TRANSPARENCY

Richard E. Fox, Dayton, Ohio, assignor to Appleton Papers Inc., Appleton, Wis.

Filed Mar. 15, 1982, Ser. No. 358,165
Int. Cl.³ B41M 5/18
U.S. Cl. 428—411 12 Claims

1. A reversibly thermally-responsive transparent film comprising a transparent film substrate coated with a solid solution consisting essentially of:

(a) at least one chromogenic compound selected from the group consisting of:

crystal violet lactone, 3,3-bis(p-dimethylaminophenyl)phthalide, 3,3-bis(1-ethyl-2-methylindol-3-yl)phthalide, 3-(1-ethyl-2-methylindol-3-yl)-3-(4-diethylamino-2-ethoxyphenyl)phthalide, a mixture of the isomers 5-(1-ethyl-2-methylindol-3-yl)-5-(4-dimethylamino-2-ethoxyphenyl)-5,7-dihydrofuro[3,4-b]pyridin-7-one and 7-(1-ethyl-2-methylindol-3-yl)-7-(4-diethylamino-2-ethoxyphenyl)-5,7-dihydrofuro[3,4-b]pyridin-5-one, a mixture of the isomers 5-(1,2-dimethylindol-3-yl)-5-(4-dimethylaminophenyl)-5,7-dihydrofuro[3,4-b]pyridin-7-one and 7-(1,2-dimethylindol-3-yl)-7-(4-dimethylaminophenyl)-5,7-dihydrofuro[3,4-b]pyridin-5-one, 6-diethylamino-2-(N-heptanoylamino)fluoran, 6-diethylamino-2-butoxyfluoran, 2-chloro-6-diethylamino-3-methyl-fluoran, 6-diethylamino-1,3,4-trimethylfluoran, 6-cyclohexylamino-2-methylfluoran, 9-diethylamino-spiro[12H-benzo(a)xanthene-12,1'(3'H)isobenzofuran-3'-one], 3',6'-diethylamino-spiro[1H-2-N-acetylisoindole-3-one-1,9'-xanthene], 3',6'-diethylamino-spiro[1,2-benz-2-N-ethyl-1,1-dioxyisothiazoline-3,9'-xanthene], bis(4,4'-diethylaminophenyl)ketone, N-Benzoylauramine, 1-(4-dimethylaminophenyl)-2-(quinolin-4-yl)ethylene, 1-phenyl-1-p-dimethylaminophenyl-6-dimethylamino-3-oxo-isochroman, bis(4,4'-diethylaminophenyl)-phenyliminomethane, 4-(p-ethoxyphenylazo)-m-phenylene diamine, 5',5''-dibromo-o-cresolsulfonephthalein, 3-(1-ethyl-2-methylindol-3-yl)-3-(4-diethylamino-2-butoxyphenyl)phthalide and 6-diethylamino-2-dibenzylaminofluoran;

(b) at least one color developer selected from the group consisting of:

phloroglucinol, gallic acid and 2',4',6'-trihydroxyacetophenone; and

(c) a suitable transparent binder therefor wherein a heat-developed image, formed by said chromogenic compound and said color developer, is stable to changes in temperature below the imaging temperature of the film.

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4,423,117

## COMPOSITE STRUCTURE

John Machonis, Jr., Schaumburg; Seymour Schmukler; Robert J. Zeitlin, both of Palatine, and Mitsuzo Shida, Barrington, all of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 820,611, Aug. 1, 1977, Pat. No. 4,298,712, which is a continuation-in-part of Ser. No. 681,480, Apr. 29, 1976, abandoned. This application May 24, 1978, Ser. No. 909,298
Int. Cl.³ B32B 27/10
U.S. Cl. 428—475.8 10 Claims

1. A composite structure comprising a solid substrate having intimately adhered thereto a modified polyolefin blend consisting essentially of:

(A) about 0.1–95 parts by weight in said blend of a graft copolymer of about 70–99.999 wt.% of a high density polyethylene backbone grafted with about 30–0.001 wt.% of x-methylbicyclo(2.2.1)hept-5-ene-2,3-dicarboxylic acid anhydride blended with both

(B) at least one elastomer of the class consisting of homopolymers of isobutylene, copolymers of isobutylene, homopolymers of chloroprene, copolymers of a diene and a vinyl aromatic compound, block copolymers of diene and a vinyl aromatic compound, copolymers of a hydroge-

nated diene and a vinyl aromatic compound, hydrogenated block copolymers of a diene and a vinyl aromatic compound, homopolymers of butadiene, and a copolymer of an ethylenically unsaturated nitrile and a diene, and

(C) at least one polyolefin resin of the class consisting of homopolymers of ethylene, copolymers of ethylene and an ethylenically unsaturated ester, and copolymers of ethylene and alpha-olefin.

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**4,423,118**

## THICKENED PAPER COATING COMPOSITION

**Peter J. Corbett, Rheinmuenster, Fed. Rep. of Germany, and Martin G. Aschwanden, Zug, Switzerland, assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Aug. 20, 1981, Ser. No. 294,596**

**Int. Cl.³ B32B *23/08***

**U.S. Cl. 428—514** **9 Claims**

1. A thickened coating color comprising (a) a coating color of an aqueous dispersion of a pigment and a binder therefor and (b) a water-soluble copolymer, different from the binder, comprising, in polymerized form, an $\alpha,\beta$-ethylenically unsaturated carboxylic acid, and ethylenically unsaturated amide and a hydrophobic monomer having limited solubility in water which, when homopolymerized, forms a water-insoluble polymer, said water-soluble copolymer being employed in amounts sufficient to thicken the coating color.

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**4,423,119**

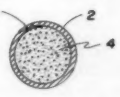
## COMPOSITE WIRE FOR FORMING WEAR RESISTANT COATINGS, AND METHOD OF MANUFACTURE

**Roger K. Brown, 16300 N. Park Dr., Apt. 1011, Southfield, Mich. 48075, and Charles K. Deak, 29844 Wagner, Warren, Mich. 48093**

**Filed Nov. 5, 1981, Ser. No. 318,881**

**Int. Cl.³ B22F *5/00***

**U.S. Cl. 428—558** **13 Claims**




1. A composite wire for application of a wear resistant coating to a workpiece, said wire having a metal sheath swaged around, and thereby compacting and confining, a core of a particulate mixture containing carbon, titanium and at least one other metal, the amount of titanium being from 8 to 24% of the total weight of all the metal in the wire and the amount of carbon being at least sufficient to react with substantially all the titanium to form titanium carbide, whereby upon the wire being heated substantially all the titanium in the core reacts with carbon in the core to form titanium carbide and the other metal in the core alloys with the sheath metal to form a coating matrix in which the titanium carbide is present as a dispersed phase in an amount of from 10 to 30% by weight of the coating.

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**4,423,120**

## LAMINATING METHOD AND ARTICLE

**Manfred Paulus, Pforzheim-Eu., and Norbert Frömel, Eisingen, both of Fed. Rep. of Germany, assignors to Fr. Kammerer GmbH, Pforzheim, Fed. Rep. of Germany**

**Filed Feb. 23, 1982, Ser. No. 351,734**

**Claims priority, application Fed. Rep. of Germany, Feb. 23, 1981, 3106607**

**Int. Cl.³ B23K *20/04***

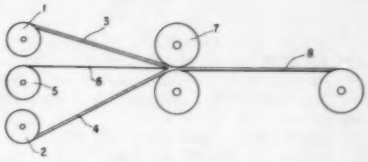
**U.S. Cl. 428—614** **22 Claims**

1. A method of laminating first and second metal sheets to one another, comprising the following steps:

(a) superposing said first and second metal sheets and including therebetween a layer of amorphous metal and

(b) subsequent to step (a) bonding to one another, by cold rolling, said first and second sheets, whereby said first and second sheets are laminated to one another while the amorphous metal is maintained in the amorphous state.

12. A laminate product comprising first and second metal sheets being in a superposed relationship and a layer of amor-




phous metal positioned between said first and second sheets, said product being obtained by a process comprising the following steps:

(a) superposing said first and second metal sheets and including therebetween a layer of amorphous metal and

(b) subsequent to step (a) bonding to one another, by cold rolling, said first and second sheets, whereby said first and second sheets are laminated to one another while the amorphous metal is maintained in the amorphous state.

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**4,423,121**

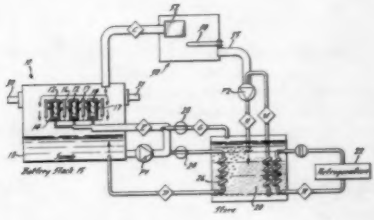
## METAL HALOGEN BATTERY CONSTRUCTION WITH COMBUSTION ARRESTER TO PREVENT SELF PROPAGATION OF HYDROGEN-HALOGEN REACTIONS

**Michael J. Hammond, Sterling Heights, Mich., and Sidika Kilic, Mystic, Conn., assignors to Energy Development Associates, Inc., Madison Heights, Mich.**

**Filed Oct. 28, 1981, Ser. No. 316,044**

**Int. Cl.³ H01M *10/36***

**U.S. Cl. 429—19** **2 Claims**



1. In a zinc-chloride battery construction, the improved combination of:

stack means for providing a plurality of cells, each of said cells having a positive electrode and a negative electrode separated by an aqueous zinc-chloride electrolyte;

sump means for collecting and containing a supply of said electrolyte;

store means for forming and storing chlorine hydrate from the chlorine gas generated in said stack means during the charging of said battery;

means for circulating said electrolyte from said sump means to said plurality of cells;

conduit means for conveying the chlorine gas generated in said stack means during the charging of said battery to said store means;

reactor means, associated with said conduit means, for reacting the chlorine gas being conveyed to said store means

with small amounts of hydrogen gas also generated in said stack means to form hydrogen chloride; and

combustion arrester means, associated with said reactor means such that the chlorine and hydrogen gases conveyed from said stack means must first pass through said combustion arrester means when being introduced to said reactor means, for resisting the self-propagation of the hydrogen chlorine reaction from said reactor means back to said stack means, said combustion arrester means comprising a high surface area gas dispersing fritted device.

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**4,423,122**

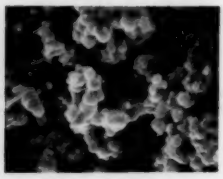
**ELECTRODE FOR MOLTEN CARBONATE FUEL CELL**

**Charles D. Iacovangelo, Schenectady, and Kenneth P. Zarnoch, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Apr. 26, 1982, Ser. No. 371,896**

**Int. Cl.³ H01M *27/04***

**U.S. Cl. 429—45** **5 Claims**



1. A porous sintered electrode useful for a molten carbonate fuel cell consisting essentially of a plurality of alloy encapsulated ceramic particle sintered together only by means of said alloy, said alloy being composed of about 5 weight % to about 95% weight % nickel balance copper, said ceramic particles ranging in size from about 0.1 micron to about 20 microns and being selected from the group consisting of lithium aluminate, strontium titanate, α-alumina and mixtures thereof, said electrode having a pore volume greater than 40% by volume but less than 85% by volume of the electrode and a pore size ranging from about 0.1 micron to about 20 microns.

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**4,423,123**

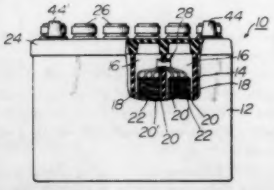
**ELECTRIC STORAGE BATTERY AND A METHOD OF MAKING THE SAME**

**Sadao Okamatsu, Fukaya, Japan, assignor to Shin-Kobe Electric Machinery Co., Ltd., Tokyo, Japan**

**Division of Ser. No. 140,966, Apr. 17, 1980, abandoned. This application Mar. 3, 1981, Ser. No. 240,178**

**Int. Cl.³ H01M *2/24***

**U.S. Cl. 429—160** **6 Claims**




1. An electric storage battery comprising a battery case having partition walls provided to form compartments therein, cell components disposed within the respective compartments and each including a plurality of positive and negative plates alternately arranged with insulating separators disposed between the adjacent positive and negative plates, and connectors provided between the adjacent cell components for electrically connecting them, characterized by each of said connectors comprising;

first plate lugs of said positive plates for one of said adjacent cell components;

second plate lugs of said negative plates for the other cell component;

said first and second plate lugs facing each other through the corresponding partition wall of said battery case;

and a welded portion of said first and second plate lugs being deformed to be gathered together;

all said plate lugs being unitary with and of substantially the same thickness as the respective plates, said welded portion being the gathered-together group of first plate lugs on one side of a partition wall and the gathered-together group of second plate lugs on the other side of the partition wall with a portion of each of the proximate one of said first and second plate lugs deformed toward each other to be in mutual contact and welded together.

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**4,423,124**

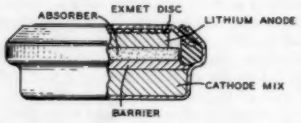
**LITHIUM-METAL CHROMATE ORGANIC ELECTROLYTE CELL AND METHOD FOR CATHODE**

**Arabinda N. Dey, Needham, Mass., assignor to Duracell Inc., Bethel, Conn.**

**Continuation of Ser. No. 545,637, Jan. 30, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,775**

**Int. Cl.³ H01M *6/14***

**U.S. Cl. 429—194** **9 Claims**




1. A non-aqueous primary battery having

(a) a light metal anode selected from the group consisting of lithium, magnesium, aluminum, beryllium, calcium, sodium, and potassium;

(b) an electrolyte solution comprised of an organic solvent and a light inorganic salt dissolved therein;

(c) a separator; and

(d) a cathode consisting of silver chromate without binder or conductive additives.

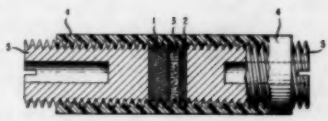
7. A method for preparing cathodes of metal chromates for use in high energy density, organic-electrolyte, electrochemical cells which consists essentially of the steps of compressing powdered metal chromate and uncured binder into cathode form at a pressure in the range 1500–5000 psi, and maintaining said cathodes at a temperature below about 25° C. throughout the formation of the cathodes, wherein said metal chromate is selected from the group consisting of metal chromates, metal dichromates and metal basic chromates.

## 4,423,125

## AMBIENT TEMPERATURE RECHARGEABLE BATTERY

Samar Basu, Somerset, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 13, 1982, Ser. No. 416,968
Int. Cl.³ H01M 6/14
U.S. Cl. 429—194 7 Claims



1. A rechargeable battery comprising an organic solvent containing a solute as the electrolyte, an anode comprising lithium intercalated graphite as its active material, and a cathode.

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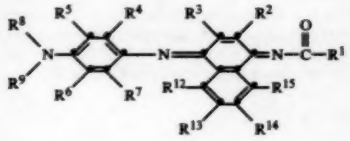
## 4,423,126

## COLOR-FORMING CARBOXAMIDONAPHTHALENE DYE PRECURSOR AND CARBOXIMIDE DYE IN PHOTOGRAPHIC MATERIAL AND PROCESS

James E. Klijanowicz, Pittsford, and Csaba A. Kovacs, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 27, 1982, Ser. No. 382,546
Int. Cl.³ G03C 7/00, 1/10
U.S. Cl. 430—9 57 Claims

51. An exposed and processed photographic element comprising a support having thereon an image comprising a dye represented by the formula:



wherein:

$R^1$ is alkyl containing 1 to 25 carbon atoms, cycloalkyl containing 5 to 8 carbon atoms, aryl containing 6 to 25 carbon atoms, alkoxy containing 1 to 25 carbon atoms, aryloxy containing 6 to 25 carbon atoms,

or a 5 or 6 member heterocyclic group;

$R^2$, $R^3$, $R^4$, $R^5$, $R^6$, and $R^7$ are individually hydrogen, alkyl containing 1 to 25 carbon atoms, aryl containing 6 to 25 carbon atoms, alkoxy containing 1 to 25 carbon atoms, arylsulfonyl containing 6 to 25 carbon atoms, chlorine, bromine, carbamoyl, sulfamoyl, carboxy, sulfonamido; and carboxamido;

$R^8$ is hydrogen, alkyl containing 1 to 25 carbon atoms, aryl containing 6 to 25 carbon atoms, acyl containing 2 to 25 carbon atoms, or carbamoyl containing 2 to 25 carbon atoms;

$R^9$ is alkyl containing 1 to 25 carbon atoms, aryl containing 6 to 25 carbon atoms, acyl containing 2 to 25 carbon atoms, or carbamoyl;

$R^{10}$ and $R^{11}$ are individually hydrogen, alkyl containing 1 to 25 carbon atoms, aryl containing 6 to 25 carbon atoms, a carbocyclic group containing 6 to 8 carbon atoms, or taken together represents the atoms necessary to complete a 5 or 6 member heterocyclic ring;

$R^{12}$, $R^{13}$, $R^{14}$, and $R^{15}$ are individually hydrogen, alkyl containing 1 to 25 carbon atoms, cyano, sulfamoyl, chlorine, carboxamido, sulfonamido, bromine and alkoxy containing 1 to 25 carbon atoms.

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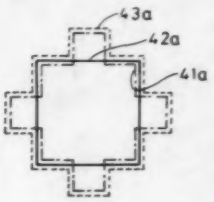
## 4,423,127

## METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Shuzo Fujimura, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 16, 1981, Ser. No. 331,477
Claims priority, application Japan, Dec. 29, 1980, 55-187308
Int. Cl.³ G03C 5/06
U.S. Cl. 430—22 6 Claims




1. In a method of manufacturing a semiconductor device by successively superimposing and printing on a semiconductor substrate a plurality of patterns, the improvement comprising:

(a) transferring onto said substrate a mask pattern including a first alignment mark of a first photomask, said first alignment mark having a closed loop contour,

(b) in the transfer of a mask pattern of a second photomask onto said substrate, positioning and then transferring a second alignment mark having a closed loop contour provided with said second photomask, relative to said first alignment mark on said substrate, in such a manner that the contour of each mark intersects with that of the other, and at least one part of one contour is offset from a closely adjacent part of the contour of the other and substantially parallel thereto, and

(c) in the transfer of a mask pattern of a third photomask, positioning and then printing a third alignment mark having a closed loop contour provided with said third mask in such a manner that a part of the contour thereof is offset from a closely adjacent part of the contour of said first alignment mark and substantially parallel thereto, and at least one part of another portion of the contour of the third mark is offset from a closely adjacent part of the contour of said second alignment mark and substantially parallel thereto.

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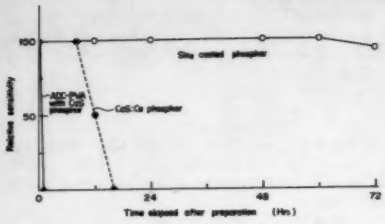
## 4,423,128

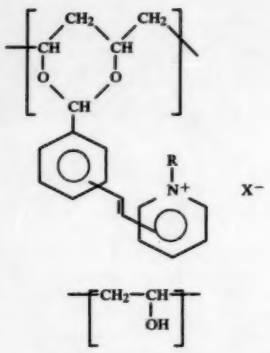
## METHOD OF MAKING PICTURE TUBE FLUORESCENT SCREEN

Norio Koike, Fukaya; Takeshi Takahara, Yokosuka; Yasuhiro Shirakawa, Kawasaki, and Kunihiro Ikari, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 20, 1982, Ser. No. 419,629
Claims priority, application Japan, Feb. 16, 1982, 57-022139
Int. Cl.³ G03C 5/00
U.S. Cl. 430—28 4 Claims

1. A method of making a picture tube fluorescent screen, comprising the steps of applying, to the inner surface of a face plate panel of a picture tube, a composition essentially consisting of a light-sensitive resin at least having recurring units (1) and (2) represented by the following general formulas:



(1)

(2)

in which R designates a hydrogen atom, an alkyl group or a lower hydroxyalkyl group, and $X^-$ designates an anion of a strong acid, and CaS-based phosphor particles surface-coated with $SiO_2$, said light-sensitive resin and said CaS-based phosphor particles being dispersed in an aqueous medium; exposing the coat thus formed to light in a required pattern by use of a mask; developing and then baking the coat to form a fluorescent screen in a required pattern.

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**4,423,129**

## ELECTROPHOTOGRAPHIC MEMBER HAVING LAYER CONTAINING METHYLIDENYL HYRAZONE COMPOUND

**Yoshio Takasu, Tama; Kiyoshi Sakai, Mitaka; Minoru Mabuchi, Tokyo; Shozo Ishikawa, Sayama, and Katsunori Watanabe, Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 30, 1981, Ser. No. 325,838**

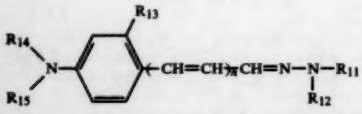
**Claims priority, application Japan, Dec. 17, 1980, 55-178532; Mar. 3, 1981, 56-30342; Jun. 11, 1981, 56-90024**

**Int. Cl.³ G03G 5/14**

**U.S. Cl. 430—59** **39 Claims**

1. An electrophotographic photosensitive member characterized by having a charge transport layer or photosensitive layer which contains at least one hydrazone compound represented by the following formula (1) or (2):

Formula (1)



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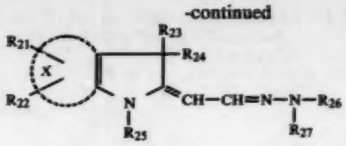
Formula (2)



wherein $R_{11}$ represents substituted or unsubstituted naphthyl; $R_{12}$ represents substituted or unsubstituted alkyl, substituted or unsubstituted aralkyl, or substituted or unsubstituted aryl; $R_{13}$ represents hydrogen, alkyl, or alkoxy; $R_{14}$ and $R_{15}$ each represent substituted or unsubstituted alkyl, substituted or unsubstituted aralkyl, or substituted or unsubstituted aryl; n is 0 or 1; when n=1, $R_{14}$ and $R_{15}$, together with the nitrogen which links them, may complete a cyclic amino group; X represents a group necessary for completing a benzene ring or naphthalene ring; $R_{21}$ and $R_{22}$ each represent hydrogen, halogen, alkyl, alkoxy, or dialkylamino; and $R_{23}$, $R_{24}$, $R_{25}$, $R_{26}$ and $R_{27}$ each represent substituted or unsubstituted alkyl, substituted or unsubstituted aralkyl, or substituted or unsubstituted aryl.

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**4,423,130**

## ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE HYDRAZONE MATERIALS

**Seiji Horie; Junji Nakano, and Hideo Sato, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Mar. 11, 1982, Ser. No. 357,112**

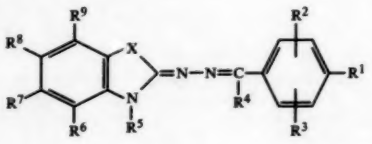
**Claims priority, application Japan, Mar. 11, 1981, 56-33832**

**Int. Cl.³ G03G 5/06, 5/14**

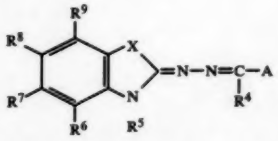
**U.S. Cl. 430—59** **10 Claims**

1. An electrophotographic light-sensitive material comprising a conductive support having formed thereon a light-sensitive layer containing a compound selected from the group of compounds consisting of general formula I, II or III:

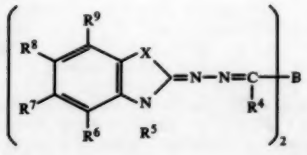
I



II



III



wherein

X is an oxygen atom, a sulfur atom, a selenium atom, an imino group a substituted imino group, a methylene group or a substituted methylene group;

$R^1$ is an alkoxy group, an aralkyloxy group, or a substituted amino group shown by

(wherein $R^{10}$ and $R^{11}$ independently are an alkyl group, a substituted alkyl group, a phenyl group, a substituted phenyl group or groups capable of forming a heterocyclic ring containing a nitrogen atom;

$R^2$ and $R^3$ independently are a hydrogen atom, a halogen atom, an alkyl group, or a lower alkoxy group;

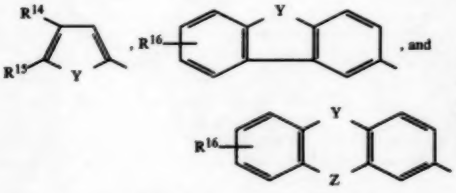
$R^4$ is a hydrogen atom, an alkyl group, a phenyl group or a substituted phenyl group;

$R^5$ is an alkyl group or a substituted alkyl group;

$R^6$, $R^7$, $R^8$ and $R^9$, independently are an alkyl group, a substituted alkyl group, a phenyl group, a substituted phenyl group, an alkoxy group, a substituted alkoxy group, an aralkyloxy group, a substituted aralkyloxy group, a hydrogen atom, a halogen atom, or an amino group shown by

(wherein $R^{12}$ and $R^{13}$ are same as the groups shown by $R^{10}$ and $R^{11}$), or form a condensed carbon ring or a condensed heterocyclic ring by combining;

A is a monocyclic heterocyclic 5-membered ring, a condensed 5-membered heterocyclic ring or a condensed heterocyclic 6-membered ring shown by following formulae



(wherein Y and Z independently are a sulfur atom, an oxygen atom, or N—$R^{17}$ and (wherein $R^{17}$ is an alkyl group having 1–4 carbon atoms); $R^{14}$ and $R^{15}$ are groups capable of forming a benzene ring or a naphthalene ring by combining; and $R^{16}$ is a hydrogen atom, substituted or unsubstituted alkyl groups, alkoxy groups, aryloxy groups, acyl groups, alkoxycarbonyl groups, aryloxycarbonyl groups, halogen atoms, monoalkylamino groups, dialkylamino group, amido groups, or nitro groups; and

B is an aryl group or a substituted aryl group and

wherein said electrophotographic material includes a charge generation material.

**5.** The electrophotographic light-sensitive material as claimed in claim **1** wherein the light-sensitive layer is comprised of a charge generating layer containing a charge generating material as the main component and a charge transporting layer comprising a compound shown by general formulae I, II and III.

**4,423,131**

## PHOTORESPONSIVE DEVICES CONTAINING POLYVINYLSILICATE COATINGS

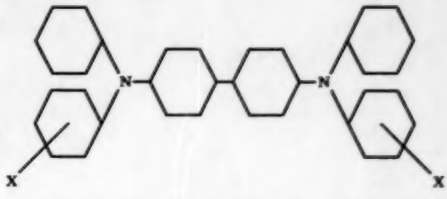
**William W. Limburg, Penfield; John M. Pochan, Ontario, both of N.Y., and Charles L. Beatty, Gainesville, Fla., assignors to Xerox Corporation, Stamford, Conn.**

**Filed May 3, 1982, Ser. No. 373,909**

**Int. Cl.³ G03G 5/14**

**U.S. Cl. 430—59** **15 Claims**

**1.** An improved photoresponsive device consisting essentially of a supporting substrate, a photogenerating layer, a charge transport layer containing diamine molecules of the following formula,



wherein X is ortho ($CH_3$), meta ($CH_3$), para ($CH_3$), ortho (Cl), meta (Cl), or para (Cl), and as a protective overcoating a top layer of a cross-linked polyvinylsilicate resulting from the reaction of polysilicic acid with a polyvinyl alcohol having a number average molecular weight of from about 10,000, to about 100,000.

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**4,423,132**

## ELECTROSTATIC IMAGE HOLDER HAVING INSULATING OVERLAYER OF FLUORINATED SURFACTANT

**Hideyo Kondo, Toride, and Hitoshi Touma, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

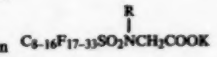
**Continuation of Ser. No. 30,838, Apr. 17, 1979, abandoned. This application Oct. 20, 1980, Ser. No. 198,459**

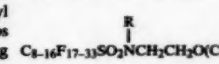
**Claims priority, application Japan, Apr. 27, 1978, 53-50628**

**Int. Cl.³ G03G 5/14**

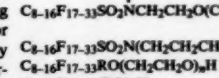
**U.S. Cl. 430—67** **6 Claims**

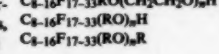
**1.** An electrophotographic image-holding member for holding electrostatic images and toner images comprising an insulating layer formed on a surface thereof, the insulating layer consisting essentially of a fluorine-containing surface active agent, a lubricant powder for improving the surface lubrication property of the insulating layer and a resin, wherein said surface active agent is selected from the group consisting of:

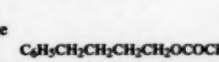




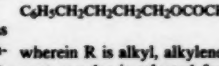
(n = 5, 10, 15)



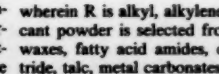




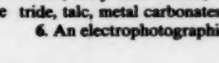
(n = 2–10)



(n = 5–20)



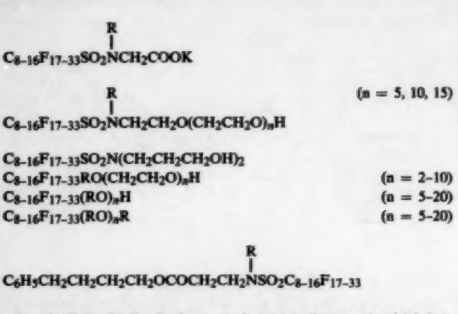
(n = 5–20)



wherein R is alkyl, alkylene, aryl, and arylene and said lubricant powder is selected from the group consisting of resins, waxes, fatty acid amides, carbons, molybdenums, boron nitride, talc, metal carbonates, or silicon dioxide.

**6.** An electrophotographic image-holding member for hold-

ing electrostatic images and toner images comprising an insulating layer formed on a surface thereof, the insulating layer consisting essentially of a fluorine-containing surface active agent, a lubricant powder and a resin selected from polyethylene, polyester, polypropylene, polystyrene, polyvinyl chloride, polyvinyl acetate, vinyl chloride-vinyl acetate copolymer, acrylic resin, polycarbonate resin, silicone resin, fluorine-containing resin and epoxy resin, said lubricant powder for improving the surface lubrication property of the insulating layer and wherein said surface active agent is selected from the group consisting of:



wherein R is alkyl, alkylene, aryl, and arylene and said lubricant powder is selected from the group consisting of resins, waxes, fatty acid amides, carbons, molybdenums, boron nitride, talc, metal carbonates, or silicon dioxide.

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**4,423,133**

## PHOTOCONDUCTIVE MEMBER OF AMORPHOUS SILICON

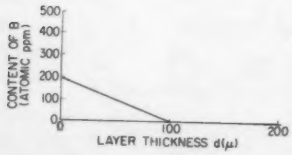
**Junichiro Kanbe, Yokohama; Shigeru Shirai, Yamato; Kyosuke Ogawa, Sakurashin; Keishi Saitoh, Tokyo, and Yoichi Osato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 10, 1982, Ser. No. 440,639**

**Claims priority, application Japan, Nov. 17, 1981, 56-184639; Dec. 24, 1981, 56-215486; Dec. 24, 1981, 56-215487**

**Int. Cl.³ G03G 5/082**

**U.S. Cl. 430—95** **26 Claims**




1. A photoconductive member which comprises a support for a photoconductive member and an amorphous layer having photoconductivity constituted of an amorphous material comprising silicon atoms as a matrix and at least one member selected from hydrogen atoms and halogen atoms as constituent atoms, said amorphous layer having a layer region which contains atoms belonging to the group III of the periodic table as constituent atoms in such a distribution that the distribution is continuous in the direction of layer thickness and said atoms are more enriched on the aforesaid support side than on the opposite side to the aforesaid support side in said layer.

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**4,423,134**

## DEVELOPING UNIT FOR ELECTROPHOTOGRAPHY

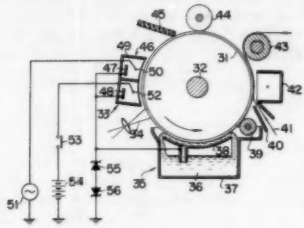
**Seiichi Miyakawa, Nagareyama; Akira Mldorikawa, Yokohama; Kenzo Ariyama, Tokyo, and Susumu Tatsumi, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Japan**

**Continuation of Ser. No. 630,519, Nov. 10, 1975, abandoned. This application Feb. 17, 1978, Ser. No. 878,749**

**Claims priority, application Japan, Nov. 12, 1974, 49-130156; Dec. 24, 1974, 49-3294**

**Int. Cl.³ G03G 9/04**

**U.S. Cl. 430—103** **16 Claims**




15. A process for developing electrostatic latent images formed by an electrophotographic process on a photosensitive member movable cyclically passed a plurality of processing stations including a developing station, the process comprising the steps of maintaining a developing electrode in electrically floating condition in spaced relation to said member to thereby vary the potential of said electrode according to the potential of said image, supplying a developing solution to the space between said electrode and said member, providing a source of voltage to said electrode, and maintaining the potential of said electrode between an upper limit and a lower limit.

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**4,423,135**

## PREPARATION OF PHOTOSENSITIVE BLOCK COPOLYMER ELEMENTS

**Gwendyline Y. Y. T. Chen, Wilmington, and James F. Brennan, Newark, both of Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.**

**Division of Ser. No. 229,068, Jan. 28, 1981, Pat. No. 4,369,246, which is a continuation-in-part of Ser. No. 160,439, Jun. 17, 1980, abandoned, which is a division of Ser. No. 926,579, Jul. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 374,567, Jun. 28, 1973, abandoned, which is a continuation-in-part of Ser. No. 130,470, Apr. 1, 1971, abandoned. This application Aug. 16, 1982, Ser. No. 408,494**

**Int. Cl.³ G03C 1/78**

**U.S. Cl. 430—271** **4 Claims**

1. A process for forming a solvent-soluble, photosensitive elastomeric element comprising applying to a sheet support a layer of a photosensitive, elastomeric composition to a dry thickness of from about 0.005 to about 0.25 inch, said composition comprising

(1) at least 30% by weight of at least one solvent-soluble, thermoplastic, elastomeric block copolymer containing at least two thermoplastic, nonelastomeric polymer blocks having a glass transition temperature above 25° C. and an average molecular weight of 2000–100,000, and between said thermoplastic, nonelastomeric polymer blocks an

elastomeric polymer block having a glass transition temperature below 10° C. and an average molecular weight of about 25,000 to 1,000,000,

(2) at least 1% by weight of an addition-polymerizable ethylenically unsaturated compound containing at least one terminal ethylenical group, and

(3) a polymerization-effective amount of polymerization initiator activatable by actinic radiation;

laminating onto said layer a combination of (a) a strippable flexible cover sheet having coated thereon (b) a solvent-soluble, flexible, polymeric film, so that the surface of said film is contiguous to the surface of said layer.

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**4,423,136**

## FREE RADICAL CURABLE RESIN COMPOSITIONS CONTAINING TRIARYLSULFONIUM SALT

**James V. Crivello, Elnora, and James E. Moore, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Continuation of Ser. No. 151,390, May 19, 1980, abandoned, which is a continuation of Ser. No. 31,508, Apr. 17, 1979, abandoned, which is a continuation of Ser. No. 822,220, Aug. 15, 1977, abandoned. This application Dec. 14, 1981, Ser. No. 330,428**

**Int. Cl.**[3] **G03C** *1/68*

**U.S. Cl. 430—281** **3 Claims**

1. A free radical photocurable organic resin composition consisting essentially of

(A) a free radical curable organic resin free of oxirane oxygen selected from the class consisting of acrylic resins, thiolene resins, unsaturated polyesters and a mixture of unsaturated polyester and vinyl aromatic compound,

(B) from 0.1 to 15% by weight of a triarylsulfonium salt of the formula,

$$[(R)_3S]^+[(Y)],$$

where R is a monovalent $C_{(6-13)}$ aromatic organic radical, and "Y" is an anion.

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**4,423,137**

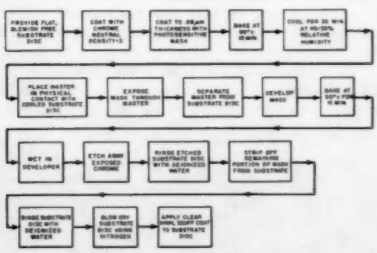
## CONTACT PRINTING AND ETCHING METHOD OF MAKING HIGH DENSITY RECORDING MEDIUM

**Marshall D. Rester, Anaheim, Calif., assignor to Quixote Corporation, Chicago, Ill.**

**Continuation-in-part of Ser. No. 201,554, Oct. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 64,177, Aug. 6, 1979, abandoned, which is a continuation-in-part of Ser. No. 43,429, May 29, 1979, abandoned. This application Jul. 31, 1981, Ser. No. 289,064**

**Int. Cl.**[3] **G03C** *5/00;* **G01D** *15/14;* **G11B** *7/02;* **H04N** *5/76*

**U.S. Cl. 430—320** **15 Claims**


PROVIDE FLAT, GLASS FREE SUBSTRATE DISC
COAT WITH CHROME REACTIVE, DENSITY=2
COAT TO OBTAIN THICKNESS WITH PHOTOSENSITIVE WASH
BAKE AT 80°C 30 MIN.
COOL FOR 30 MIN AT 45-50% RELATIVE HUMIDITY
PLACE MASTER IN PHYSICAL CONTACT WITH COATED SUBSTRATE DISC
EXPOSE MASK THROUGH MASTER
SEPARATE MASTER FROM SUBSTRATE DISC
DEVELOP MASK
BAKE AT 120°C FOR 15 MIN
WET IN DEVELOPER
ETCH AWAY EXPOSED CHROME
RINSE ETCHED SUBSTRATE DISC WITH DEIONIZED WATER
STRIP OFF REMAINING MASK PORTION OF MASK FROM SUBSTRATE
RINSE SUBSTRATE DISC WITH DEIONIZED WATER
BLOW DRY SUBSTRATE DISC USING NITROGEN
APPLY CLEAR VINYL SHIPPING COAT TO SUBSTRATE DISC

1. A method for fabricating a high density recording medium comprising the following steps:

(a) providing a substrate having a first surface covered by a reflecting layer;

(b) coating at least a portion of the reflecting layer with a masking layer of a radiation sensitive material, said masking layer having a thickness less than about 0.1 microns;

(c) exposing a microscopic pattern on the masking layer by a contact printing step such that a first patterned plurality of microscopic regions of the masking layer, each having a minimum dimension of less than about 0.6 microns, is exposed to a radiation to a different extent than is a second region of the masking layer;

(d) then selectively removing the first plurality of microscopic regions of the masking layer to expose a plurality of corresponding regions of the underlying reflecting layer, each corresponding region having a minimum dimension of less than about 0.6 microns;

(e) selectively removing the plurality of corresponding regions of the reflecting layer by an etching step to expose a plurality of corresponding regions of the underlying substrate, the second region of the masking layer acting to mask and protect the corresponding region of the underlying reflecting layer during the etching step; and then

(f) removing the second region of the masking layer.

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**4,423,138**

## RESIST DEVELOPER WITH AMMONIUM OR PHOSPHONIUM COMPOUND AND METHOD OF USE TO DEVELOP O-QUINONE DIAZIDE AND NOVOLAC RESIST

**John R. Guild, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jan. 21, 1982, Ser. No. 341,419**

**Int. Cl.**[3] **G03C** *5/22, 5/34;* **G03F** *7/08*

**U.S. Cl. 430—326** **11 Claims**

1. In an aqueous developer solution for a positive-working light-sensitive composition, the solution including a solute effective to provide a pH of at least 12.0;

the improvement wherein said solution includes a cation selected from the group consisting of tetraalkylammonium or phosphonium wherein each said alkyl individually has from 2 to 7 carbon atoms, benzyltrialkylammonium or phosphonium wherein each alkyl of said trialkyl individually has from 1 to 5 carbon atoms, and benzyltriarylammonium or phosphonium wherein each said aryl individually has from 6 to 10 nuclear atoms;

and an anion for said cation;

said cation being (a) different from the cations of said solute and (b) present in solution in an amount which enhances the selectivity of the solution and which, along with the solute, produces a development time no longer than about 60 sec. for a sufficiently imagewise-exposed resist composition comprising a (1) cresol-formaldehyde resin with a weight average molecular weight of about 6000 in admixture with (2) about 18% by weight of said resin of a quinone diazide sulfonic acid ester of a trihydroxy benzophenone.

11. A method of selectively developing a sufficiently imagewise-exposed layer of a light-sensitive novolak and quinone diazide composition, comprising contacting said layer with an aqueous solution of a solute effective to provide a pH of at least 12.0; and a cation soluble in said solution and selected from the group consisting of tetraalkylammonium or phosphonium wherein each said alkyl individually has from 2 to 7 carbon atoms, benzyltrialkylammonium or phosphonium wherein each alkyl of said trialkyl individually has from 1 to 5 carbon atoms, and benzyltriarylammonium or phosphonium wherein each said aryl individually has from 6 to 10 nuclear carbon atoms; and an anion for said cation; said cation being different from the cations of said solute; to remove exposed areas of said layer.

**4,423,139**

## STABILIZER COMBINATION FOR DYE OXIDATION

**Russell R. Isbrandt, White Bear Lake Township, County of Ramsey, and Robert D. Lowrey, Aitkin, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Continuation-in-part of Ser. No. 218,558, Dec. 22, 1980, abandoned. This application Feb. 24, 1982, Ser. No. 352,053**

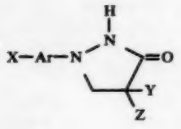
**Int. Cl.³ G03C *1/52***

**U.S. Cl. 430—338** **12 Claims**

1. In a thermally developable imaging material, an imageable layer comprising a polymeric binder, at least one leuco dye, and nitrate salt, said nitrate salt having a cation which is nonreactive with said leuco dye and said nitrate salt capable of liberating an oxidizing amount of $HNO_3$ or oxides of nitrogen when heated to a temperature of no more than 200° C. for 60 seconds, wherein the improvement comprises the presence of a stabilizing combination, said combination comprising

(1) an aromatic compound having at least two substituents selected from the group consisting of amino and hydroxy substituents, wherein said polyhydroxy aromatic compounds form quinones upon oxidation, said polyamino aromatic compounds form diimines upon oxidation, and said aromatic compounds having amino and hydroxy substituents form quinonimines upon oxidation, and

(2) 1-phenyl-3-pyrazolidinone, or derivatives of 1-phenyl-3-pyrazolidinone having the general formula



wherein

Ar is selected from the group consisting of phenyl and naphthyl groups;

X is selected from the group consisting of an aryl group, and alkyl group, straight or branched chain, having from about 1 to 5 carbon atoms, an alkoxy group, straight on branched chain, having from about 1 to 5 carbon atoms, H, F, Cl, Br and I; and

Y and Z are independently selected from the group consisting of H and alkyl groups, straight or branched chain, having about 1 to 5 carbon atoms,

said stabilizing combination being present in an amount sufficient to promote a synergistic stabilizing effect in said thermally developable imaging material.

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**4,423,140**

## SILVER HALIDE EMULSIONS CONTAINING AROMATIC LATENT IMAGE STABILIZING COMPOUNDS

**Arthur H. Herz, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

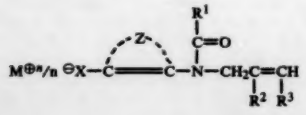
**Filed Jun. 25, 1298, Ser. No. 392,043**

**The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.**

**Int. Cl.³ G03C *1/34***

**U.S. Cl. 430—445** **17 Claims**

1. A photographic silver halide emulsion containing a latent image stabilizing amount of a compound represented by the formula:



wherein:

$R^1$ is hydrogen, alkyl, or aryl;

$R^2$ and $R^3$ are each individually hydrogen, alkyl, alkoxy, carboxy, alkoxycarbonyl, or aminocarbonyl;

X is a middle chalcogen;

Z represents the atoms completing an aryl aromatic nucleus;

n is an integer of 1 or 2; and

$M^{\oplus a}$ is a cation of valence n chosen from the group consisting of an onium ion, an ion from Group IA or IIA, and a metal ion from Group IIB, VIIB, IVA, or VA.

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**4,423,141**

## CARBOXY-ESTER LACTONE POLYMER NEUTRALIZING-TIMING LAYER FOR COLOR TRANSFER ASSEMBLAGES

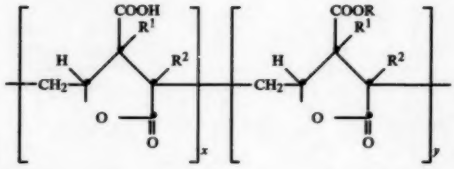
**Edward P. Abel, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Division of Ser. No. 341,412, Jan. 21, 1982, Pat. No. 4,395,477. This application Dec. 10, 1982, Ser. No. 448,572**

**Int. Cl.³ G03C *1/40, 5/54;* B32B *27/06;* C08F *34/02***

**U.S. Cl. 430—454** **3 Claims**

1. A cover sheet adapted to be permeated by an alkaline processing composition comprising a transparent support having thereon a neutralizing-timing layer consisting essentially of a carboxy-ester-lactone polymer having recurring units of the formula



wherein

R is alkyl having from 1 to about 12 carbon atoms or aralkyl having from 7 to about 12 carbon atoms;

$R^1$ and $R^2$ are each independently hydrogen or methyl;

x is about 1 to about 15 mole %;

y is about 85 to about 99 mole %,

said polymer comprising an acid content of up to about 1 milliequivalent of acid per gram of polymer.

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**4,423,142**

## PHOTOGRAPHIC SILVER HALIDE COLOR MATERIALS AND PROCESS FOR THE PRODUCTION OF DYE IMAGES BY DIFFUSION TRANSFER

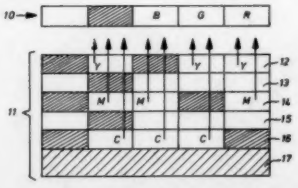
**Wilhelmus Janssens, Aarschot, Belgium, assignor to AGFA-Gevaert, N.V., Mortsel, Belgium**

**Filed Feb. 18, 1982, Ser. No. 350,033**

**Claims priority, application United Kingdom, Mar. 2, 1981, 8106515**

**Int. Cl.³ G03C *5/54, 1/40, 1/10***

**U.S. Cl. 430—504** **10 Claims**




1. A photographic material suitable for producing by diffusion transfer a positive colour image in a diffusion transfer

receptor layer, said material comprising on a support at least two differently spectrally sensitive negative working silver halide emulsion layers and having operatively associated with each of said emulsion layers a different dye providing compound that is initially immobile in an alkali-permeable colloid medium and from which by reduction in an alkaline medium a dye or dye precursor can be split off in diffusible state, characterized in that at least one of said negative working silver halide emulsion layers is associated in water-permeable relationship with a visible light-sensitive direct-positive working silver halide emulsion layer.

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4,423,143

## β-D-GALACTOSIDASE CONJUGATE FOR ENZYME IMMUNOASSAYS

**Kenneth E. Rubenstein, Menlo Park, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Company, Palo Alto, Calif.**

**Continuation-in-part of Ser. No. 221,235, Dec. 30, 1980, Pat. No. 4,376,825, which is a division of Ser. No. 36,929, May 7, 1979, Pat. No. 4,282,325, which is a continuation-in-part of Ser. No. 857,145, Dec. 5, 1977, Pat. No. 4,203,802, which is a division of Ser. No. 722,964, Sep. 13, 1976, Pat. No. 4,067,774, which is a continuation of Ser. No. 481,022, Jun. 20, 1974, abandoned, which is a division of Ser. No. 304,157, Nov. 6, 1972, Pat. No. 3,852,157, which is a continuation-in-part of Ser. No. 802,683, Jun. 2, 1977, Pat. No. 4,190,496, which is a continuation of Ser. No. 760,499, Jan. 19, 1977, Pat. No. 4,191,613, which is a continuation-in-part of Ser. No. 722,964, Sep. 13, 1976, Pat. No. 4,067,774. This application Apr. 29, 1981, Ser. No. 258,848**

**The portion of the term of this patent subsequent to Jun. 18, 1991, has been disclaimed.**

**Int. Cl.³ G01N *33/54*; C12N *9/96***

**U.S. Cl. 435—7** **5 Claims**

1. An enzyme conjugate of β-D-galactosidase bonded to on the average with from about 1 to 24 haptens of molecular weight of from about 125 to 1,000 and having at least one heteroatom, wherein said conjugated enzyme retains at least about 10% of the original enzyme activity and wherein the enzymatic activity of the conjugate is reduced by at least 30%, when said haptens are bound to receptors for said haptens.

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4,423,144

## RADIOENZYMATIC ASSAY OF CATECHOLAMINES

**Garland A. Johnson, Charleston Township, Kalamazoo County, and Jacob D. Peuler, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**

**Continuation of Ser. No. 931,651, Aug. 8, 1978, Pat. No. 4,288,542, which is a continuation of Ser. No. 681,999, Apr. 30, 1976, abandoned. This application Sep. 2, 1981, Ser. No. 298,560**

**Int. Cl.³ C12Q *1/48*; C12N *9/10, 9/99***

**U.S. Cl. 435—15** **7 Claims**

1. A method for reducing the inhibition of catechol-O-methyl transferase enzymatic activity by a component of mammalian blood serum or plasma in a mixture comprising catechol-O-methyl transferase, a cation of oxidation number +2 selected from the group consisting of magnesium, cobalt and manganese, a compound which stabilizes the catechol-O-methyl transferase catechol-amine enzyme-substrate system selected from the group of glutathione dithiothreitol, ascorbic acid, sodium metabisulfite, mercaptoethanol and cysteine, the methyl donor S-adenosyl-L-methione-($^3$H)-methyl, and mammalian blood serum or plasma which comprises contacting said mixture with an anti-catechol-O-methyl transferase enzyme inhibiting effective amount of ethylene glycol bis(aminoethylether)N,N'tetraacetic acid, the transferase, cation, stabilizing compound and methyl donor present in such quantities that substantially all the epinephrine, norepinephrine and dopamine present in the mammalian blood serum or plasma are O-methylated.

4,423,145

## ENHANCED GROWTH MEDIUM AND METHOD FOR CULTURING HUMAN MAMMARY EPITHELIAL CELLS

**Martha R. Stampfer, 7290 Sayre Dr.; Helene S. Smith, 5693 Cabot Dr., both of Oakland, Calif. 94611, and Adeline J. Hackett, 82 Evergreen Dr., Orinda, Calif. 94563**

**Filed May 7, 1981, Ser. No. 261,086**

**Int. Cl.³ C12Q *1/18*; C12N *5/00*; C12R *1/91***

**U.S. Cl. 435—32** **14 Claims**

1. A method for preparing samples of human mammary tissue to obtain a mass culture of mammary epithelial cells, said method comprising:

digesting the tissue samples with an enzyme digestion mixture including at least one enzyme selected to break down the mammary tissue into clumps of epithelial cells substantially free from attached stromal cells;

separating the clumps of epithelial cells from the stromal cells and other cellular material; and,

culturing the clumps of epithelial cells in a medium including conditioned media obtained from cultures of cells selected from the group consisting of human fetal intestine epithelial cells and human bladder epithelial cells so that the mammary epithelial cells in the clumps proliferate.

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4,423,146

## COMPOSITION OF MATTER AND PROCESS

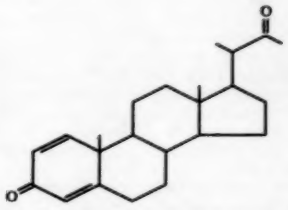
**John C. Knight, and Merle G. Wovcha, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**

**Filed Aug. 10, 1981, Ser. No. 291,725**

**Int. Cl.³ C12P *33/16*; C12N *1/20*; C12R *1/32***

**U.S. Cl. 435—55** **5 Claims**

1. A one-stage fermentation process for preparing a compound of the formula



which comprises cultivating *Mycobacterium fortuitum* NRRL B-12505 in an aqueous nutrient medium under aerobic conditions in the presence of a steroid with a C-17 side chain and recovering the desired product.

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4,423,147

## MONOCLONAL ANTIBODY TO INTERFERON-α

**David S. Secher, 2 Nightingale Ave., Cambridge, England (CB1 4SQ), and Derek C. Burke, 41 Portland St., Leamington Spa, Warwickshire, England CV32 5EY**

**PCT No. PCT/GB81/00067, § 371 Date Dec. 10, 1981, § 102(e) Date Dec. 10, 1981, PCT Pub. No. WO81/02899, PCT Pub. Date Oct. 15, 1981**

**PCT Filed Apr. 13, 1981, Ser. No. 333,856**

**Claims priority, application United Kingdom, Apr. 11, 1980, 8012096**

**Int. Cl.³ G01N *33/54, 33/68*; C12Q *1/00***

**U.S. Cl. 435—68** **7 Claims**

1. A monoclonal antibody produced by a murine derived hybrid cell line wherein the antibody is capable of specifically binding to at least one antigenic determinant of interferon-α.

4,423,148

## PROCESS FOR PRODUCING 20-DIHYDRO-20-DEOXY-23-DE(MYCINOSYLOXY)-TYLOSIN

Gene M. Wild, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 2, 1982, Ser. No. 394,599
Int. Cl.³ C12P 19/62; C12R 1/54; C07H 17/08
U.S. Cl. 435—76 4 Claims

1. The method of producing the antibiotics 20-dihydro-20-deoxy-23-de(mycinosyloxy)tylosin and 5-O-mycaminosyltylactone, which comprises cultivating *Streptomyces fradiae* ATCC 31733 or a mutant or recombinant thereof which produces said antibiotics in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of antibiotic activity is produced.

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4,423,149

## PROCESS FOR THE PRODUCTION OF D-GLUCOSONE

William F. Amon, Jr., Danville; John Geigert, Clayton, and Saul L. Neidleman, Oakland, all of Calif., assignors to Cetus Corporation, Berkeley, Calif.

Filed Oct. 15, 1981, Ser. No. 311,505
The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.
Int. Cl.³ C12P 19/02, 7/26, 7/60, 7/00
U.S. Cl. 435—105 12 Claims

1. A method for making D-glucosone from glucose, comprising, providing an aqueous solution of glucose, and converting at least about 95% of the glucose in solution to D-glucosone in solution by enzymatic oxidation with a cell free enzyme while removing or utilizing co-produced hydrogen peroxide.

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4,423,150

## PREPARATION OF HIGH FRUCTOSE SYRUPS FROM SUCROSE

Robert E. Heady, Park Forest, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 225,917, Jan. 19, 1981, abandoned, which is a division of Ser. No. 913,278, Jun. 9, 1978, Pat. No. 4,276,379, which is a continuation-in-part of Ser. No. 807,289, Jun. 16, 1977, abandoned. This application Dec. 21, 1982, Ser. No. 452,605
Int. Cl.³ C12N 9/10, 11/10; C12R 1/645
U.S. Cl. 435—193 4 Claims

1. A cell-free fructosyl transferase enzyme preparation derived from *Pullularia pullulans*, having the enzyme coprecipitated with pullulan as a carrier and capable of converting sucrose to a product comprising a monosaccharide fraction containing a major amount of glucose and a minor amount of fructose, and polysaccharides containing at least 66% by weight fructosyl moieties, wherein the fructosyl moieties are linked by (2—1)-beta linkages.

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4,423,151

## PROCESS FOR PREPARATION OF CONTROL FOR USE IN ESTROGEN RECEPTOR TESTS

Richard J. Baranczuk, Overland Park, Kans., assignor to Peter S. Brune, Kansas City, Mo., a part interest

Filed Sep. 24, 1981, Ser. No. 305,108
Int. Cl.³ C09K 3/00; G01N 33/50
U.S. Cl. 436—8 12 Claims

6. A process for the production of a control sample for use in estrogen receptor assays; said process comprising the steps of:

(a) collecting uteri tissue from approximately 6 day pregnant rabbits;
(b) freezing said tissue;
(c) shreading said tissue into relatively small strips;
(d) adding a buffer solutin having a pH of approximately 7.5 to said tissue;
(e) homogenizing said buffer and tissue;
(f) centrifuging said homogenized buffer and tissue for approximately one half hour at approximately 40,000 RPM;
(g) removing the supernatant from said centrifuged buffer and tissue;
(h) freezing said supernatant; and
(i) subjecting said frozen supernatant to a vacuum so as to freeze dry said supernatant into dry flakes.

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4,423,152

## EFFLUENT DETECTION METHODS

David F. Lewis, Monroe, and Edward J. Kaplin, Stamford, both of Conn., assignors to York Research Corporation, Stamford, Conn.

Filed Jun. 8, 1981, Ser. No. 271,650
Int. Cl.³ G01N 31/12, 33/00
U.S. Cl. 436—56 7 Claims

1. A method of monitoring the gaseous, particle-bearing effluent of combustion, comprising the steps of combining with combustible material at least two tracer elements chosen from the lanthanide group in a pre-determined ratio with respect to each other,

subjecting said combination to combustion under said known conditions,

gathering at least one sample of particles from gaseous effluent,

determining by means of elemental analytical means the ratio, with respect to each other, of the responses of said sample corresponding to those exhibited by said tracer elements before they were combined with said combustible material, and

comparing said ratio of responses of said sample to that of said tracer elements before they were combined with said combustible material.

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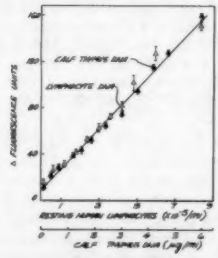
4,423,153

## METHODS AND COMPOSITIONS FOR THE DETECTION AND DETERMINATION OF CELLULAR DNA

David F. Ranney, Dallas, Tex., and Alfred J. Quattrone, Westlake, Calif., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Dec. 3, 1981, Ser. No. 327,104
Int. Cl.³ G01N 33/52
U.S. Cl. 436—63 42 Claims




1. A fluid composition, adapted for use in selectively detecting and determining the cellular content of double stranded, helical DNA in the presence of cellular debris, comprising in aqueous solution:

a divalent metallic cation cofactor;

a fluorochrome which in the presence of the cofactor is capable of significant fluorescence enhancement upon interaction with double-stranded, helical DNA;

a small concentration of a compatible surfactant which is effective to enhance solubilization of DNA and cellular debris.

12. A method for selectively detecting and determining the intracellular content of double stranded, helical DNA in the presence of cellular debris comprising:

providing a sample cell culture;

solubilizing the cell culture;

admixing the solubilized cell culture with a fluid composition comprising a divalent metallic cation cofactor, and a fluorochrome which in the presence of the cofactor is capable of significant fluorescence enhancement upon interaction with double stranded, helical DNA; and

determining the extent of fluorescence enhancement by comparing the fluorescence of the admixed solubilized cell culture and fluid composition relative to fluorescence of the fluid composition alone, said fluorescence enhancement being a measure of the intracellular content of double stranded helical DNA.

17. The method in accordance with claim 12 wherein the fluid composition comprises $Mg^{+2}$ as the divalent metallic cation cofactor and mithramycin as the fluorochrome.

19. The method in accordance with claim 12 wherein the fluid composition further includes a compatible surfactant, the surfactant effective to enhance solubilization of the cell culture.

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## 4,423,154
## SIMULTANEOUS RADIOASSAY OF FOLATE AND VITAMIN B12

**Sidney Gutcho, Monsey, and Lillian Mansbach, New City, both of N.Y., assignors to Becton Dickinson and Company, Paramus, N.J.**

**Division of Ser. No. 919,387, Jun. 26, 1978, Pat. No. 4,279,859, which is a continuation-in-part of Ser. No. 817,563, Jul. 21, 1977, Pat. No. 4,146,602, which is a continuation-in-part of Ser. No. 762,992, Jan. 27, 1977, abandoned. This application Feb. 12, 1981, Ser. No. 233,855**

**Int. Cl.³ G01N *33/56, 33/60*; B07D *71/00***

**U.S. Cl. 436—505** **17 Claims**

1. A reagent for use in effecting a simultaneous assay for folate and vitamin $B_{12}$ comprising:

a dual tracer comprising an admixture of a folate tracer labeled with a first radioactive isotope and a vitamin $B_{12}$ tracer labeled with a second radioactive isotope different from said first isotope.

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## 4,423,155
## DIMETHYL ETHER SYNTHESIS CATALYST

**Weldon K. Bell, Pennington, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.**

**Filed Feb. 20, 1981, Ser. No. 236,472**

**Int. Cl.³ B01J *21/04, 23/06, 23/72***

**U.S. Cl. 502—38** **8 Claims**

1. A catalyst composition comprising:

(A) coprecipitated metal components consisting essentially of Cu, Zn and Al wherein the atomic ratio of Al/(Cu+Zn) is greater than or equal to 0.2:1 and the ratio of Cu/Zn is from 0.2:1 to 5.0:1 and

(B) an acidic dehydrating component.

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## 4,423,156
## PROCESS FOR PREPARING UNSATURATED HYDROCARBONS

**Bernd Büssemeier, Mulheim-Ruhr; Boy Cornils, Dinslaken, and Carl-Dieter Frohning, Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany**

**Continuation of Ser. No. 299,746, Sep. 8, 1981, abandoned. This application Jun. 13, 1983, Ser. No. 502,536**

**Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 3035404**

**Int. Cl.³ C07C *1/04, 1/06***

**U.S. Cl. 518—717** **9 Claims**

1. In a process for the preparation of unsaturated hydrocarbons comprising catalytically hydrogenating carbon oxides with hydrogen at temperatures from 220° C. to 500° C. at pressures of up to 30 bars, in the presence of a catalyst having at least one group VIII metal selected from iron and cobalt and containing at least one difficulty reducible oxide from the group consisting of vanadium, manganese, titanium and thorium, the improvement which comprises carrying out said hydrogenating in the presence of at least one aliphatic alcohol having one to three carbon atoms, said alcohol being present in the vapor state.

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## 4,423,157
## FLUORINATED CATION EXCHANGE MEMBRANE

**Yoshinori Masuda, Yokohama, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan**

**Continuation-in-part of Ser. No. 254,542, Apr. 15, 1981, abandoned. This application Dec. 8, 1981, Ser. No. 328,720**

**Claims priority, application Japan, Apr. 18, 1980, 55-50278**

**Int. Cl.³ B01J *47/12*; C08F *6/00***

**U.S. Cl. 521—27** **24 Claims**

1. A fluorinated cation exchange membrane having a multilayered structure, comprising a layer containing sulfonic acid groups as ion-exchange groups and a layer containing carboxylic acid groups as principal ion-exchange groups, said membrane being formed by a process which comprises subjecting said membrane which has been fabricated into a suitable form to treatment with an acid by immersing said membrane therein, heat treating said membrane in an aqueous atmosphere or an aqueous solution at a temperature not lower than 110° C. for at least 30 minutes, and further subjecting said membrane to conditioning by immersing in a 0.01 to 10 N aqueous caustic soda solution prior to being mounted in an electrolytic cell.

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## 4,423,158
## ION ADSORBENT FOR METALS HAVING A COORDINATION NUMBER GREATER THAN TWO

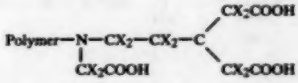
**Jerker O. Porath, Lidingö, Sweden, assignor to Gelinnovation Handelsaktiebolag, Lidingö, Sweden**

**Filed Jan. 27, 1983, Ser. No. 461,512**

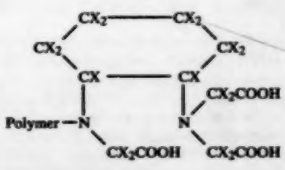
**Int. Cl.³ B01J *39/18***

**U.S. Cl. 521—32** **10 Claims**

1. Metal ion adsorbent, characterized in that it is composed of an organic polymer having a hydrophilic character through a content of an average at least 0.5 substituents per monomer unit of any of the following types: OH, O, CO, $NH_2$, NH or N, so that the concentration of these groups reaches at least 25 mol-percent, the polymer in a non-aqueous state containing at least 10 umol of metal binding groups per gram of adsorbent, and the metal binding group being characterized by five coordinating ligand atoms, two being nitrogen atoms and being carboxylic acid groups, the metal binding group being bound to the polymer as follows:



or

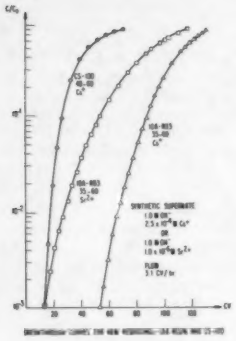


wherein X is H or an alkyl group.

## 4,423,159
## PHENOLIC CATION EXCHANGE RESIN MATERIAL FOR RECOVERY OF CESIUM AND STRONTIUM

Martha A. Ebra, and Richard M. Wallace, both of Aiken, S.C., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 5, 1982, Ser. No. 375,232
Int. Cl.³ B01J 39/18
U.S. Cl. 521—35 5 Claims



1. Process for the simultaneous recovery of cesium or strontium or both from an aqueous alkaline solution containing such cesium or strontium or both which comprises:

(A) contacting said aqueous alkaline solution with a phenolic chelating resin material to sorb said cesium or strontium or both from said aqueous alkaline solution, said phenolic chelating resin material having been prepared by the process which comprises (i) reacting resorcinol with iminodiacetic acid or catechol in the presence of formaldehyde in an alkaline medium to form a condensation polymer gel, (ii) drying the condensation polymer gel, and (iii) comminuting the dried condensation polymer gel to form said phenolic cation exchange material; and

(B) separating said aqueous alkaline solution depleted of cesium and strontium from the cesium-and-strontium-loaded phenolic cation resin material.

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## 4,423,160
## PROCESS FOR FORMING ANTI-LUMPING AND FAST-COOL VINYL AROMATIC EXPANDABLE POLYMER PARTICLES

Adolph V. DiGiulio, Wayne, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 31, 1983, Ser. No. 462,157
Int. Cl.³ C08J 9/18
U.S. Cl. 521—59 8 Claims

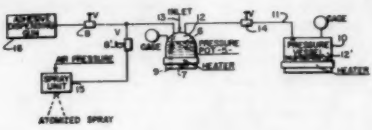
1. A process for producing expandable vinyl aromatic polymer particles which exhibit antilumping properties, and fast-cooling properties in molded products produced therefrom comprising:

polymerizing a vinyl aromatic monomer in which is dissolved about 0.5 to 4.0 percent by weight, based on the vinyl aromatic monomer, of a graded diblock rubbery copolymer of 2–50 weight percent of polymerized vinyl aromatic monomer and 50–98 weight percent of polymerized conjugated diene, to form vinyl aromatic polymer particles containing said graded diblock rubbery copolymer; and impregnating the vinyl aromatic polymer particles, containing said graded diblock rubbery copolymer, with a blowing agent.

## 4,423,161
## APPARATUS AND METHOD FOR DISPENSING FOAMABLE COMPOSITIONS

Walter H. Cobbs, Jr., Amherst, and William R. Rehman, Vermilion, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 16,207, Feb. 28, 1979, Pat. No. 4,301,119.
This application May 11, 1981, Ser. No. 262,468
Int. Cl.³ C08J 9/30
U.S. Cl. 521—73 9 Claims




1. A method for dispensing a foamable composition having a constant foam-volume ratio comprising

containing in a vessel a foamable mixture of polymeric liquid composition and a blowing agent under pressure, said vessel having means defining a vapor space above said liquid composition and a dispensing outlet,

holding in a pressure container the blowing agent under pressure, said pressure container having means defining a vapor space,

delivering blowing agent from the vapor space of said pressure container to the vapor space of said vessel to maintain a substantially constant composition of said blowing agent in said vapor space of said vessel above said liquid mixture under a vapor pressure at least equal to the vapor pressure of said mixture, and

dispensing a foam of constant foam-volume ratio from said foamable mixture.

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## 4,423,162
## POLYURETHANES FROM HYDROXYMETHYL POLYOLS AND POLYISOCYANATES

Dwight E. Peerman, and Edgar R. Rogier, both of Minnetonka, Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Filed Sep. 7, 1982, Ser. No. 415,734
Int. Cl.³ C12P 7/12
U.S. Cl. 521—164 56 Claims

1. Urethane linked reaction products of at least one non-gelled polyol of the formula:

$$R—X\text{-}A\text{-}H]_p$$

where

R is a polyol, polyamine or aminoalcohol residue;

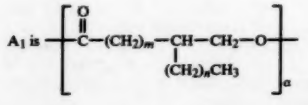
X may be the same or different and is O, N or NH;

p is an integer from 2 to 6; and,

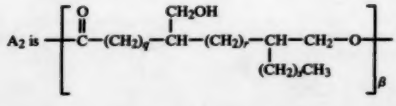
A may be the same or different and is selected from the group consisting of $A_1$, $A_2$ and $A_3$ and combinations of $A_1$, $A_2$ and $A_3$,

where

$A_1$ is



$A_2$ is



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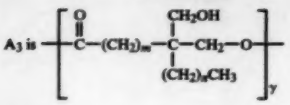

where m, n, q, r, s, $\alpha$, $\beta$ and $\gamma$ are integers and where
m>3
n≧0 and
m+n is from 11 to 19
q>3
r≧0
s ≧0 and
q+r+s is from 10 to 18
$\alpha$ is from 0 to 10
$\beta$ is from 0 to 10 and
$\gamma$ is from 1 to 10, except that all $\alpha$'s, $\beta$'s and $\gamma$'s in any given compound are not all zero;
and from about 80% to about 120% on a hydroxy-isocyanate equivalent basis of at least one polyisocyanate.

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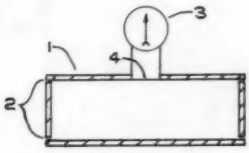
**4,423,163**

**METHOD OF PRODUCING PHENOLIC FOAM USING PRESSURE AND FOAM PRODUCED BY THE METHOD**

Herman P. Doerge, Oakmont, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Oct. 9, 1980, Ser. No. 195,457
Int. Cl.³ B29D 27/04
U.S. Cl. 521—181 8 Claims




1. A method for making a phenolic foam having an initial K factor less than 0.15 and having substantial K factor retention from a phenolic resole resin foamable composition comprising from 40 to 90 percent by weight phenolic resole resin, from 1 to 20 percent by weight fluorine containing blowing agent, from 0.1 to 10 percent by weight surfactant, from 2 to 40 percent by weight water and from 2 to 35 percent by weight acid catalyst comprising introducing the phenolic resole resin foamable composition into a substantially closed volume wherein the composition is allowed to foam under initially ambient atmospheric pressure until the foam fills the volume and wherein a pressure in excess of about 2 pounds per square inch on the outer surface of the foam is attained within the volume and wherein the temperature during foaming is from about 4° C. to 122° C.

5. The phenolic foam produced by the method of claim 1.

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**4,423,164**

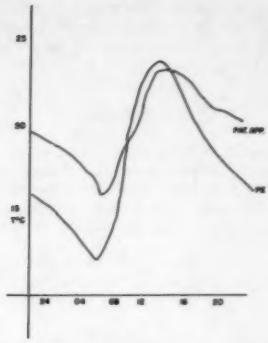
**POLYMERIC FILMS FOR USE IN AGRICULTURE**

Rami Bar, Kibbutz Ginegar, Israel

Filed Jan. 18, 1982, Ser. No. 340,248
Claims priority, application Israel, Feb. 4, 1981, 62066
Int. Cl.³ C08K 3/26, 3/20
U.S. Cl. 523—135 7 Claims

1. A polymeric composition in film or sheet form, adapted to transmit a large part of incident sunlight, a substantial part thereof by forward scattering, and to reflect a large part of incident IR radiation, consisting essentially of:

a polymer or copolymer, which is generally transparent; and micron size particles of an additive comprising 1–12% magnesium oxide and 0–8% calcium carbonate, the total com-




bined additive being in the range of 1 to 12%, all percentages being by weight of the polymeric composition.

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**4,423,165**

**WATER-BORNE COATING COMPOSITION MADE FROM EPOXY RESIN, FIRST POLYMERIC ACID, TERTIARY AMINE AND SECOND POLYMERIC ACID**

Lee R. Harper, Media; Judith E. Obetz, Bryn Mawr, both of Pa., and William H. Steinmetz, Collingswood, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 16, 1982, Ser. No. 369,077
Int. Cl.³ C08K 3/20; C08L 63/00
U.S. Cl. 523—409 39 Claims

1. A water-borne coating composition consisting essentially of liquid carrier and a second reaction product made by blending a second carboxyl-functional polymer with a first reaction product, wherein said first reaction product is the product of the reaction in an organic media of:

(A) 50–90% by weight, based on the weight of (A) plus (B), of an epoxy resin containing, on the average, about 1½ to 2 terminal 1,2-epoxy groups per molecule and having an epoxy equivalent weight of 750–5000;

(B) a first carboxyl-functional polymer in an amount sufficient to provide at least 1.25 equivalents of carboxyl groups, when the source of the carboxyl group is a monoprotic acid, and at least 2.0 equivalents of carboxyl groups, when the source of such groups is a diprotic acid, per equivalent of 1,2-epoxy groups in the epoxy resin, said polymer having a weight average molecular weight (determined by light scattering) of about 10000–160000 and an acid number of 100–500;

(C) at least 1.25 equivalents of a tertiary amine per equivalent of 1,2-epoxy groups in the epoxy resin, said tertiary amine being selected from the group consisting of $R_1R_2R_3N$, pyridine, N-methylpyrrole, N-methyl piperidine, N-methyl pyrrolidine, N-methyl morpholine, and mixtures thereof and wherein $R_1$ and $R_2$ are substituted or unsubstituted monovalent alkyl groups containing one or two carbon atoms in the alkyl portion and $R_3$ is a substituted or unsubstituted monovalent alkyl group containing 1–4 carbon atoms;

(D) optionally, 10–90% of the amount required for stoichiometric reaction with the carboxyl-functional polymer of (B) of at least one primary, secondary or tertiary amine or monofunctional quaternary ammonium hydroxide;

wherein for increasing ratios of carboxyl groups to 1,2-epoxy groups, the amount of amine is increased to keep the carboxyl-functional polymer water dispersible;

(E) said second carboxyl-functional polymer being blended in an amount of 5 to 200 parts by weight per 100 parts by weight of (A) plus (B) and having a weight average mo-

lecular weight (determined by light scattering) of about 10,000–160,000 and an acid number of 50–500, said acid number being at least 50 units different than the acid number of said first carboxyl-functional polymer, said second reaction product containing not less than 30% by weight of epoxy resin (A) based on the total of (A), (B) and (E).

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4,423,166

UNGELLED POLYEPOXIDE-POLYOXYALKYLENEPOLYAMINE RESINS, AQUEOUS DISPERSIONS THEREOF, AND THEIR USE IN CATIONIC ELECTRODEPOSITION

Thomas C. Moriarity, Allison Park, and William J. Geiger, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 284,865, Jul. 20, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 420,552

Int. Cl.³ C08L 63/02; C08G 59/14

U.S. Cl. 523—414 16 Claims

1. An ungelled resin formed from reacting:

(A) a polyepoxide and

(B) a polyoxyalkylenepolyamine;

the ratio of equivalents of active hydrogens in (B), with primary amine groups being considered monofunctional, to equivalents of epoxy in (A) being within the range of 1.20 to 1.70:1.

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4,423,167

RESINOUS COMPOSITIONS CURABLE THROUGH A TRANSESTERIFICATION CURING MECHANISM

Joseph T. Valko, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 29, 1981, Ser. No. 288,238

Int. Cl.³ C08L 63/02

U.S. Cl. 523—414 12 Claims

1. A coating composition which is heat curable to give a solvent-resistant coating comprising:

(A) a polymeric polyol,

(B) a polyester crosslinking agent having at least two beta-alkoxyester groups per molecule,

(C) a transesterification catalyst;

said composition being substantially free of polyesters containing more than one beta-hydroxyester group per molecule.

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4,423,168

RESINOUS COMPOSITIONS CURABLE THROUGH A TRANSESTERIFICATION CURING MECHANISM

Joseph T. Valko, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 29, 1981, Ser. No. 288,241

Int. Cl.³ C08L 63/02

U.S. Cl. 523—414 9 Claims

1. A coating composition which is heat curable to give a solvent-resistant coating comprising:

(A) a polymeric polyol,

(B) a crosslinking agent having at least two beta-amido ester groups per molecule,

(C) a transesterification catalyst.

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4,423,169

RESINOUS COMPOSITIONS CURABLE THROUGH A TRANSESTERIFICATION CURING MECHANISM

Joseph T. Valko, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 29, 1981, Ser. No. 288,240

Int. Cl.³ C08L 63/02

U.S. Cl. 523—414 18 Claims

1. A coating composition which is heat curable to give a solvent-resistant coating comprising:

(A) a polymeric polyol,

(B) a crosslinking agent having at least two beta- and/or gamma-ester ester groups per molecule,

(C) a transesterification catalyst.

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4,423,170

ONE COMPONENT WATER REDUCED EPOXY ADHESIVES

Harold G. Waddill, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 15, 1982, Ser. No. 434,684

Int. Cl.³ C08L 63/00, 63/02; C08G 59/50

U.S. Cl. 523—417 13 Claims

1. An epoxy resin composition comprising:

(A) a diepoxide comprising the condensation product of

(a) epichlorohydrin with

(b) an aromatic or aliphatic diol,

which diepoxide is partially reacted with a polyoxyalkyleneamine of molecular weight of about 900 to about 2500; and

(B) a latent curative agent in an aqueous medium.

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4,423,171

TERTIARY ALCOHOL-DIBLOCKED DIISOCYANATE DIUREA OLIGOMERS AND COATING COMPOSITIONS COMPRISING SAME

Joseph W. Holubka, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1981, Ser. No. 334,792

The portion of the term of this patent subsequent to Aug. 2, 2000, has been disclaimed.

Int. Cl.³ C08G 18/28; C08K 5/05, 5/07; C08L 63/00

U.S. Cl. 523—454 37 Claims

1. A chain-extendable, crosslinkable tertiary alcohol-diblocked diisocyanate diurea oligomer of number average molecular weight about 300 to about 5000 comprising the reaction product of diamine of molecular weight about 50 to about 700, with half-blocked organic diisocyanate of molecular weight about 120 to about 2000 in molar ratio of about 1:2, respectively, said half-blocked organic diisocyanate comprising the reaction product of an alcohol blocking agent bearing a tertiary hydroxyl group, with organic diisocyanate in molar ratio of about 1:1, said oligomer having a de-blocking temperature of about 80° C. to about 220° C.

15. A solvent based resin composition comprising:

A. a chain-extendable, crosslinkable tertiary alcohol-diblocked diisocyanate diurea oligomer of number average molecular weight about 300 to about 5000 comprising the reaction product of diamine of molecular weight of about 50 to about 700, with half-blocked organic diisocyanate of molecular weight about 120 to about 2000 in molar ratio of about 1:2, respectively, said half-blocked organic diisocyanate comprising the reaction product of an alcohol of 4 to 20 carbons bearing a tertiary hydroxyl group, with organic diisocyanate in molar ratio of about 1:1, said oligomer having de-blocking temperature of about 80° C. to about 220° C.;

B. polyepoxide having 2 to about 10 epoxide groups and having a molecular weight of about 100 to about 1000, in weight ratio to said oligomer of about 1:1 to about 1:10; and

C. organic solvent.

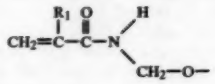
4,423,172

## SELF-CURABLE COATING COMPOSITION FOR CATHODE-PRECIPITATING ELECTRODEPOSITION

Yutaka Otsuki, Yokohama; Yoshihiko Araki, Tokyo; Hiroyoshi Omika, Yokohama; Hajime Hara, Fujisawa, and Kazuho Aoyama, Tokyo, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1982, Ser. No. 363,427
Claims priority, application Japan, Apr. 3, 1981, 56-50359
Int. Cl.³ C08K 5/07
U.S. Cl. 523—454 8 Claims

1. A self-curable coating composition for cathode-precipitating electrodeposition comprising: (i) 95–50 parts of Resin (A) which is a high molecular weight compound having a number average molecular weight of 500–50,000 and containing 50–200 millimols of a tertiary amino group per 100 grams of Resin (A) and 200–2,000 millimols of a non-conjugated carbon-carbon double bond per 100 grams of Resin (A); and (ii) 5–50 parts of Resin (B) which is a high molecular weight epoxy resin having a number average molecular weight of 300–30,000 and containing 50–300 millimols of a tertiary amino group per 100 grams of Resin (B) and 50–600 millimols of a group of the formula



wherein $R_1$ is hydrogen or a methyl group, per 100 grams of Resin (B), said composition being neutralized with an acid to become water-soluble or water-dispersible.

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4,423,173

## LIGNOSULFONATE-PHENOL-FORMALDEHYDE RESIN BINDER

Eugene R. Janiga, Roselle, Ill., assignor to Masonite Corporation, Chicago, Ill.

Filed Sep. 29, 1982, Ser. No. 427,841
Int. Cl.³ C08L 97/02, 97/00, 61/14; C08H 5/02
U.S. Cl. 524—14 20 Claims

1. A method of manufacturing a lignosulfonate-phenol-formaldehyde resin comprising

heating a mixture of phenol, formaldehyde, lignosulfonate and alkali wherein said lignosulfonate comprises about 5 to about 80 percent of the total weight of phenol, formaldehyde and lignosulfonate and wherein said lignosulfonate is mixed with said phenol and formaldehyde under alkaline conditions before substantial reaction between said phenol and said formaldehyde; and

heating said mixture to form a lignosulfonate-phenol-formaldehyde polymer.

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4,423,174

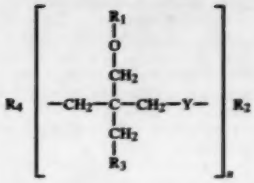
## SYNTHETIC RESIN COMPOSITIONS CONTAINING 2,2,6,6-TETRAMETHYL PIPERIDYL ETHERS

Motonobu Minagawa, Koshigaya; Naohiro Kubota, Ageo, and Ryoji Kimura, Urawa, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Filed Jul. 26, 1982, Ser. No. 401,481
Claims priority, application Japan, Aug. 20, 1981, 56-129349
Int. Cl.³ C07D 401/02, 405/30; C08K 5/34, 5/51
U.S. Cl. 524—99 43 Claims

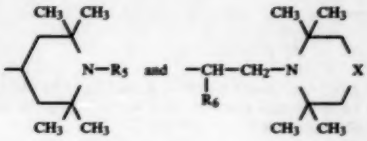
1. A stabilizer composition for synthetic resins comprising:

(1) at least one 2,2,6,6-tetramethyl piperidyl ether having the formula:

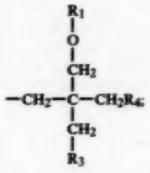


wherein:

$R_1$ is selected from the group consisting of



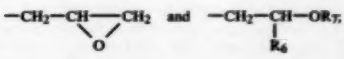
$R_2$ is selected from the group consisting of hydrogen, alkyl, hydroxyalkyl, saturated and unsaturated acyl having from one to about eighteen carbon atoms; $R_1$ and



$R_3$ is selected from the group consisting of hydrogen, alkyl and hydroxyalkyl having from one to about eighteen carbon atoms; cycloalkyl and alkylphenyl having from six to about eighteen carbon atoms; and $—OR_1$;

$R_4$ is selected from the group consisting of hydroxyl, alkoxy having from one to about ten carbon atoms, acyloxy having from one to about ten carbon atoms, and $—OR_1$;

$R_5$ is selected from the group consisting of hydrogen, oxy; alkyl, hydroxyalkyl and alkenyl having from one to about eighteen carbon atoms; cycloalkyl and alkylphenyl having from six to about eighteen carbon atoms;



$R_6$ is selected from the group consisting of hydrogen, alkyl and hydroxyalkyl having from one to about eighteen carbon atoms; cycloalkyl and alkylphenyl having from six to about eighteen carbon atoms;

$R_7$ is hydrogen or acyl having from one to about eighteen carbon atoms;

$R_8$ is alkylene having from one to about ten carbon atoms;

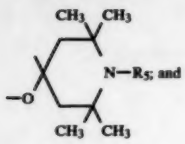
X is selected from the group consisting of methylene, $—CH_2—$, carbonyl C=O, >CH—O—$R_7$ and

-continued

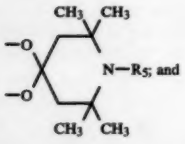
Y is oxy —O— or —O—C—Z—C—O— (O O)

where Z is alkylene or thioalkylene having from two to about ten carbon atoms; or phenylene having from six to about ten carbon atoms; and

n is a number from 1 to 50; $R_2$ and $R_3$; or $R_2$ and $R_4$ can be taken together to form



when n is 1 and Y is —O—, $R_2$ and $R_3$ or $R_2$ and $R_4$ can be connected together as a C—C linkage to form a cyclic ring, or



(2) at least one phenolic antioxidant having at least one phenolic hydroxyl group, and at least one phenolic nucleus, and from about eight to about three hundred carbon atoms.

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**4,423,175**

## HALOGEN-CONTAINING RESIN COMPOSITIONS STABILIZED BY METHIONINE DIKETOPIPERAZINE

**Nobuyoshi Kitamura, Sagamihara; Nobuo Ito, Ooisomachi, and Koji Takeuchi, Yokohama, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan**

**Continuation of Ser. No. 348,274, Feb. 12, 1982, Pat. No. 4,384,059. This application Feb. 7, 1983, Ser. No. 464,698**

**Claims priority, application Japan, Feb. 26, 1981, 56-27270; Feb. 26, 1981, 56-27271**

**Int. Cl.³ C08K *5/37***

**U.S. Cl. 524—100** **7 Claims**

1. A halogen-containing resin composition, which comprises:

(A) a halogen-containing resin;

(B) as a stabilizer assistant an amount sufficient for thermal stabilization of methionine diketopiperazine; and

(C) at least one stabilizer selected from the group consisting of alkaline earth metal, zinc and organotin compounds.

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**4,423,176**

## MOLDING COMPOSITIONS COMPRISING POLYPHENYLENE ETHER, POLYSULFONE AND VINYL AROMATIC-DIENE BLOCK COPOLYMER

**Gim F. Lee, Jr., Albany, N.Y., assignor to General Electric Company, Pittsfield, Mass.**

**Continuation of Ser. No. 106,921, Dec. 26, 1979, abandoned. This application May 11, 1981, Ser. No. 262,702**

**Int. Cl.³ C08K *5/51***

**U.S. Cl. 524—153** **13 Claims**

1. A molding composition comprising a polyphenylene ether, a polysulfone, an effective amount of a plasticizer consisting essentially of an aromatic phosphate and an impact strength improving amount of a selectively hydrogenated block copolymer of the linear or radial teleblock type comprising blocks of polymerized vinyl aromatic compound and blocks of polymerized diene.

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**4,423,177**

## THICKENABLE COMPOSITION BASED ON AN ADDUCT OF ALKADIENE POLYMERS AND ACID ANHYDRIDE

**Guy Senatore, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Mar. 5, 1982, Ser. No. 355,277**

**Int. Cl.³ C08K *3/22***

**U.S. Cl. 524—251** **10 Claims**

1. A composition comprising an admixture of

(a) an adduct of a medium to high vinyl alkadiene polymer, said polymer having about 60 to about 95% of the alkadiene units bonded in the 1,2-mode, and a cyclic or acyclic anhydride of a mono or dicarboxylic acid,

(b) a thickening agent selected from the group consisting of alkaline earth metal oxides, alkaline earth metal hydroxides and mixtures thereof,

(c) an organic peroxide,

(d) a thickening additive selected from the group consisting of water, alkanols, phenols, amines and mixtures thereof.

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**4,423,178**

## PLASTICIZERS FOR VINYL CHLORIDE POLYMERS

**James T. Renshaw, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.**

**Division of Ser. No. 150,877, May 19, 1980, Pat. No. 4,313,866, which is a continuation-in-part of Ser. No. 972,762, Dec. 26, 1978, abandoned. This application Oct. 28, 1981, Ser. No. 315,687**

**Int. Cl.³ C08K *5/10***

**U.S. Cl. 524—287** **14 Claims**

1. A solid film prepared by casting a film of a vinyl chloride polymer composition on a solid surface, fusing the cast film and then cooling the fused film below its freezing point, said composition comprising a finely divided vinyl chloride polymer essentially uniformly dispersed in a plasticizing amount of a plasticizer consisting essentially of, by weight, from about 50% to about 90% prime ester at least about 40 parts per hundred parts by weight of which is aromatic diester selected from alkyl benzyl succinates, glutarates and mixtures thereof in which said alkyl contains from about 3 to about 6 carbon atoms, up to about 20% essentially non-olefinic hydrocarbon boiling between about 200° and about 325° C. and from about 10% to about 50% non-aromatic diester having a molecular weight from about 230 to about 300.

11. A method which comprises dispersing finely divided particles of a vinyl chloride polymer in a plasticizing amount of a plasticizer consisting essentially of, by weight, from about 50% to about 90% prime ester at least about 40 parts per hundred parts by weight of which is aromatic diester selected from alkyl benzyl succinates, glutarates and mixtures thereof in which said alkyl contains from about 3 to about 6 carbon atoms, up to about 20% essentially non-olefinic hydrocarbon boiling between about 200° and about 325° C. and from about 10% to about 50% non-aromatic diester having a molecular weight from about 230 to about 300, casting a film of the resulting composition on a solid surface, fusing the cast film and then cooling the fused film to provide a solid film.

4,423,179

## DIMER ACID BASED POLYURETHANE COATING COMPOSITIONS

Matthew Gusgliardo, Bloomfield, N.J., assignor to Inmont, Clifton, N.J.

Continuation-in-part of Ser. No. 306,817, Sep. 29, 1981, abandoned. This application Mar. 21, 1983, Ser. No. 476,951
Int. Cl.³ C09D 3/52, 3/72
U.S. Cl. 524—539 17 Claims

1. A coating composition consisting essentially of

(A) a urethane reaction product of a diisocyanate and a polyester polyol wherein the polyester polyol has a molecular weight of from about 1200 to about 2500 and is formed from

(1) an alcohol component having an average functionality of at least 2.0, and

(2) an acid component consisting essentially of dimer acid

said urethane reaction product having a hydroxyl value of at least 10; and

(B) an aminoplast resin.

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4,423,180

## ORGANIC ZIRCONIUM COMPOUNDS TO REDUCE VISCOSITY OF FILLED LIQUID POLYMERS

Bernardas Brizgys, Southgate, and James A. Gallagher, Grosse Ile, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Aug. 12, 1982, Ser. No. 407,654
Int. Cl.³ C08K 5/06, 5/09
U.S. Cl. 524—394 12 Claims

1. A composition useful in the preparation of a polyurethane comprising an inorganic filler, a liquid polymer containing at least two active hydrogen-containing groups per molecule, as determined by the Zerewitinoff Method, and an effective amount of a viscosity reducing organic zirconium compound selected from the group consisting of zirconium tetraacetylacetonate and the zirconium salts of aliphatic, aromatic and arylaliphatic carboxylic acids, wherein said aliphatic carboxylic acids have 1 to about 18 carbon atoms; said aromatic carboxylic acids have 1 to 3 aromatic rings; and said arylaliphatic carboxylic acids have 1 to about 18 aliphatic carbon atoms and 1 to 3 aromatic rings.

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4,423,181

## POLYETHYLENE-POLYBUTADIENE BLEND

Eric G. Kent, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Continuation-in-part of Ser. No. 232,625, Feb. 9, 1981, abandoned. This application Jun. 14, 1982, Ser. No. 388,223
Claims priority, application Canada, Mar. 10, 1980, 347358
Int. Cl.³ C08L 9/00, 23/06; C08K 3/00, 3/26
U.S. Cl. 524—425 6 Claims

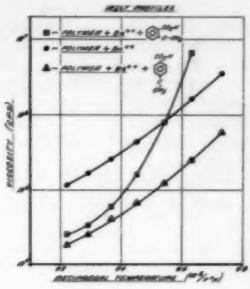
1. A process for the production of a thermoplastic composition having improved low temperature impact properties comprising, per 100 parts by weight of polymer components, from about 80 to about 95 parts by weight of polyethylene having a density of from about 0.95 to about 0.965 g/cm³ and from about 5 to about 20 parts by weight of an unhydrogenated polybutadiene having from about 85 to about 98 percent of 1,4-content and having from about 95 to 100 percent of the theoretical unsaturation, in which process the polyethylene is supplied to a two roll mill or an internal mixer preheated to a temperature of about 120° to 155° C. and fluxed for 2 to 3 minutes, the polybutadiene is added and the mixing continued for about 5 to 7 minutes to produce a uniform mixture, after which the mixture is removed and cooled.

4,423,182

## PRESSURE SENSITIVE HOT MELT ADHESIVES

Benjamin Bartman, Maple Glen, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 339,202, Jan. 13, 1982, Pat. No. 4,360,638. This application Feb. 18, 1982, Ser. No. 349,725
The portion of the term of this patent subsequent to Nov. 23, 1999, has been disclaimed.
Int. Cl.³ C08K 5/09
U.S. Cl. 524—367 12 Claims



1. A composition comprising

(a) an organic polymer containing at least one carboxylic group per polymer molecule, and

(b) at least one miscible metal salt of an o-methoxy aryl acid in a ratio of at least $10^{-3}$ moles of total metal salt to moles of polymer carboxylic acid.

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4,423,183

## FLUOROELASTOMER FILM COMPOSITIONS AND SOLUTIONS CONTAINING FATTY POLYAMIDE CURATIVES

Donald Close, Stow, Ohio, assignor to David Hudson, Inc., Stow, Ohio

Continuation of Ser. No. 187,721, Sep. 16, 1980, abandoned, which is a continuation of Ser. No. 178,895, Aug. 18, 1980, abandoned. This application Nov. 25, 1981, Ser. No. 324,845
Int. Cl.³ C08F 8/30
U.S. Cl. 524—546 5 Claims

1. An improved cured fluoroelastomer film composition comprising:

a fluoroelastomer gum; and

from about 0.5 to 10 parts of a fatty polyamide curative, per 100 parts of rubber the improvement wherein said film composition is devoid of metal oxides.

2. An improved fluoroelastomer solution comprising:

a fluoroelastomer gum;

from about 0.5 to 10 parts of a fatty polyamide curative per 100 parts of rubber; and

a solvent for said gum and said curative with the provision that said solution is devoid of metal oxides.

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4,423,184

## SYNTHETIC SUPERABSORBENT FIBERS

Stephen L. Kopolow, Plainsboro, and Pronoy K. Chatterjee, Spotswood, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Filed Sep. 8, 1981, Ser. No. 300,086
Int. Cl.³ C08F 255/00
U.S. Cl. 525—57 9 Claims

1. Hydrophilic, water retentive synthetic wood pulp fibers capable of forming low density fluff and comprising polyolefin and polyvinyl alcohol, said polyvinyl alcohol having grafted thereto hydrolyzed ethylene acrylate acrylonitrile copolymer, said fibers having been freeze dried.

2. Hydrophilic, water retentive synthetic wood pulp fibers capable of forming low density fluff and comprising polyolefin and polyvinyl alcohol, said polyvinyl alcohol having grafted thereto hydrolyzed ethylene acrylate acrylonitrile copolymer, said fibers having been solvent dried.

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4,423,185

## THERMOPLASTIC RESINOUS COMPOSITION

Koichi Matsumoto; Yoshihiko Katayama, and Hisaya Sakurai, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 3, 1980, Ser. No. 126,273

Claims priority, application Japan, Mar. 8, 1979, 54-26136; Mar. 27, 1979, 54-35070; Apr. 13, 1979, 54-44272; Jun. 29, 1979, 54-81446; Jul. 4, 1979, 54-8396

Int. Cl.³ C08L *75/04, 51/06*

U.S. Cl. 525—66 4 Claims

1. A thermoplastic resinous composition consisting essentially of, based on the weight of the thermoplastic resinous composition,

(a) 5% to 70% by weight of a thermoplastic polyurethane elastomer, and

(b) 30% to 95% by weight of a modifiled polyolefin which is an olefin polymer having grafted thereon 0.005% through 5% by mole of maleic acid or maleic anhydride per mole of the recurring unit in the olefin polymer.

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4,423,186

## IMPACT RESISTANT POLYAMIDE MOULDING COMPOSITIONS

Ulrich Grigo, New Martinsville, W. Va.; Friedrich Fahnler, and Rudolf Binsack, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 13, 1982, Ser. No. 449,174

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151441

Int. Cl.³ C08L *31/00, 51/04, 77/00*

U.S. Cl. 525—66 9 Claims

1. A thermoplastic moulding composition comprising

I. from 35 to 99% by weight of a polyamide, and

II. from 65 to 1% by weight of a partly cross-linked polymer mixture containing a gel proportion of from 5 to 95% by weight and consisting of:

(a) from 5 to 80% by weight of (a1) a copolymer of ethylene with (meth)acrylic acid and/or with a (meth)acrylate containing a $C_1$–$C_8$ alcohol residue (a2) a graft product of polyethylene or an ethylene/vinyl acetate copolymer as the graft substrate and (meth)acrylic acid and/or a (meth)acrylate containing a $C_1$–$C_8$ alcohol residue as the grafted-on monomers or mixtures of (a1) and (a2) and

(b) from 95 to 20% by weight of a polybutadiene rubber having a Mooney viscosity $ML_{1+4}$ (100) of from 5 to 100 and having a gel proportion of less than 2% by weight, determined in boiling chlorobenzene,

III. optionally conventional additives, and

IV. optionally from 10 to 60% by weight, based on the total moulding composition, of fillers of reinforcing materials or mixtures thereof,

the total of I and III and of (a) and (b) being 100% by weight in each case.

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4,423,187

## THERMOPLASTIC MOLDING MATERIALS

Franz Brandstetter, Neustadt; Adolf Echte, Ludwigshafen; Juergen Hambrecht, Neckargemuend-Dilsberg; Karl H. Illers, Otterstadt, and Edmund Priebe, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 356,067

Int. Cl.³ C08L *61/04*

U.S. Cl. 525—68 3 Claims

1. A thermoplastic molding material based on an impact resistant polystyrene and a polyphenylene ether comprising

(a) 5 to 95 parts by weight of an impact resistant polymer consisting of styrene alone or styrene and up to 10 percent by weight of acrylonitrile, maleic anhydride or methacrylic acid esters wherein

(1) 5 to 95 parts by weight of a flexible component of the impact resistant polymer consisting of a graft polymer of styrene and a compound selected from the group consisting of polybutadiene and styrene butadiene block copolymer have a glass temperature below −70° C. and

(2) 95 to 5 parts by weight of a flexible component of the impact resistant polymer, containing a polymer of acrylic acid ester as the rubber component made by grafting styrene to a cross-linked acrylate polymer have a glass temperature in the range from 0° to −70° C. and

(b) 95 to 50 parts by weight of a polyphenylene ether.

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## VINYL HALIDE POLYMER BLENDS OF ENHANCED IMPACT RESISTANCE

Gilbert Witschard, Grand Island, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 172,929, Jul. 28, 1980, Pat. No. 4,319,002, which is a continuation of Ser. No. 881,949, Feb. 28, 1978, abandoned. This application Mar. 8, 1982, Ser. No. 355,425

The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.

Int. Cl.³ C08L *51/00, 53/00*

U.S. Cl. 525—71 30 Claims

1. In a vinyl halide polymer composition which is capable of being molded to an impact resistant, substantially transparent to translucent article and which comprises a blend of a vinyl halide polymer wherein the major proportion of the monomer units are vinyl halide monomer residues and a polymeric impact modifier for polyvinyl halide wherein the monomer units consist essentially of methyl methacrylate, 1,3-butadiene and styrene residues and which has about the same refractive index as said vinyl halide polymer, the improvement wherein the blend also comprises a block thermoplastic elastomer wherein the major proportion of the monomer units are residues of a mono-alkenyl-substituted aromatic compound of a benzene or naphthalene series of 8 to 20 atoms and a conjugated alkadiene hydrocarbon of 4 to 10 carbon atoms, said block elastomer being normally incompatible with said vinyl halide polymer, said vinyl halide polymer being present in a proportion of about 50 to about 99 weight percent in said blend, and said polymeric impact modifier and said block elastomer together being present in a proportion of about one to about 50 weight percent in said blend with the weight ratio of said block elastomer to said polymeric impact modifier being about 5:1 to about 1:5.

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4,423,189

## COMPOSITIONS OF A POLYPHENYLENE ETHER RESIN, LOW MOLECULAR WEIGHT POLYSTYRENE AND A BLOCK COPOLYMER

William R. Haaf, Voorheesville, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 28, 1981, Ser. No. 315,893

Int. Cl.³ C08L *53/00*

U.S. Cl. 525—92 12 Claims

1. A thermoplastic composition which comprises:

(a) a polyphenylene ether resin;

(b) a low molecular weight homopolystyrene having a number average molecular weight in the range between about 400 and 65,000; and

(c) a hydrogenated block copolymer of an alkenyl aromatic compound and a conjugated diene.

4,423,190

## BLOCK COPOLYMER MIXTURE OF CONJUGATED DIENE AND VINYL AROMATIC HYDROCARBON

Isaburo Fukawa; Kunio Satake, both of Yokohamashi; Tsuyoshi Yamada, Yokosukashi; Kiyoshi Hayakawa, Yokohamashi, and Yasushi Sato, Kawasakishi, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 58,940, Jul. 19, 1979, abandoned, which is a division of Ser. No. 609,684, Sep. 2, 1975, Pat. No. 4,208,356. This application Dec. 23, 1981, Ser. No. 333,656

Claims priority, application Japan, Sep. 17, 1974, 49-105970; Mar. 7, 1975, 50-27064

Int. Cl.³ C08F 297/04

U.S. Cl. 525—98 1 Claim

1. A block copolymer mixture of conjugated diene and vinylaromatic hydrocarbon produced by the following two step polymerization:

a first step (A) for preparing (a) a living block copolymer having the following general formula:

$$-A-B)_{n+1}Li \text{ or } A-B-A)_nLi,$$

where A is a polymer block consisting mainly of conjugated diene, B a polymer block consisting mainly of vinylaromatic hydrocarbons, and n is an integer of 1 or more, by polymerizing a conjugated diene and a vinylaromatic hydrocarbon, in a ratio by weight of vinylaromatic hydrocarbon to conjugated diene of 60/40 or less, the monomers being employed in an amount of 1 to 80% by weight of the total monomers to be used in the two polymerization steps, using an organomonolithium compound as a catalyst and a solvent consisting mainly of aliphatic hydrocarbon, the polymers not being inactivated with an inactivating agent, and

a second step (B) of (1) preparing (b) a vinylaromatic hydrocarbon polymer and (2) simultaneously extending block copolymer chains obtained in said step (A), by adding to the living block copolymer obtained in said step (A), a vinylaromatic hydrocarbon, the monomer being employed in an amount of 99 to 20% by weight of total monomers to be used in the two polymerization steps, and adding an organolithium compound as a catalyst and a solvent consisting mainly of an aliphatic hydrocarbon, and polymerizing the said monomer to simultaneously obtain polymer (b) by the freshly added organolithium compound and an ultimate block copolymer by extending the chains of the living block copolymer obtained in said step (A), thereby obtaining a block copolymer mixture;

the block copolymer mixture being characterized in that the structure of the polymer (b) obtained in the second polymerization step (B) alone is substantially the same as the structure of the portion of the ultimate block copolymer obtained by extending, in the second step, the chains of the living block copolymer obtained in the first polymerization step (A), and the block copolymer mixture having a ratio of the vinylaromatic hydrocarbon content, in weight percent, of the ultimate block copolymer to the vinylaromatic hydrocarbon content, in weight percent, of the polymer (b) of at least 1/1.8, and having a ratio of vinylaromatic hydrocarbon content to conjugated diene content of 60/40 to 95/5.

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4,423,191

## HIGH FREQUENCY ELECTRIC FIELD CURING OF POLYMERIC COMPOSITES

Richard E. Haven, Mountain View, Calif., and Nam P. Suh, Sudbury, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 1, 1981, Ser. No. 259,657

Int. Cl.³ C08L 67/06

U.S. Cl. 525—169 16 Claims

1. A method for curing a resinous composition comprising an admixture of a thermosetting resin and dielectrically lossy particles, said lossy particles having a dielectric constant substantially the same as the dielectric constant of the resin, said method comprising subjecting said admixture to a high frequency alternating electric field for sufficient time to heat the lossy particles and initiate the chemical reaction to cure the resin.

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4,423,192

## LUBRICATED THERMOPLASTIC COMPOSITIONS OF POLYVINYLIDENE FLUORIDE

Huynh Van Lang, Lyons, and Jean-Paul Ollivier, Paris, both of France, assignors to PCUK Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation of Ser. No. 173,879, Jul. 31, 1980, abandoned, and Ser. No. 916,279, Jun. 16, 1978, abandoned. This application Jun. 16, 1982, Ser. No. 388,948

Claims priority, application France, Jun. 24, 1977, 77 19382

Int. Cl.³ C08L 27/18

U.S. Cl. 525—199 3 Claims

1. A process for molding polyvinylidene fluoride compositions using a lubricated polyinylidene consisting esstentially of:

(a) blending said polyvinylidene fluoride composition with from about 0.1 W% to about 10 W% low molecular weight polytetrafluoroethylene wherein from about 0.1 W% to about 0.8 W% low molecular weight polytetrafluoroethylene is used to lubricate high molecular weight polyvinylidene fluoride compositions and from about 0.5 W% to about 10 W% low molecular weight polytetrafluoroethylene is used to lubricate medium and low molecular weight polyvinylidene fluoride compositions, said polytetrafluoroethylene having a molecular weight of about 800,000 or less and being sufficiently low in molecular weight to reduce the viscosity of said polyvinylidene fluoride in its molten state, said polytetrafluorothylene having at least 90 mole percent tetrafluoroethylene groups, and said polyvinylidene fluoride having at least 90 mole percent vinylidenefluoride groups and having a melt index when measured at 250° C. of: (1) from about 50 to 1000 when it is a high molecular weight polymer, (2) from about 1000 to 4000 when it is a medium molecular polymer and (3) over 4000 when it is a low molecular weight polymer; and

(b) molding said lubricated polyvinylidene fluoride composition.

3. A thermoplastic product produced according to the process of claim 1.

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4,423,193

## DEHYDROCHLORINATION OF VINYL CHLORIDE RESINS FOLLOWED BY GRAFT COPOLYMERIZATION WITH COPOLYMERIZABLE MONOMERS

Earl G. Melby, Uniontown; Harry W. Cocain, Cuyahoga Falls, and Hubert J. Fabris, Akron, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 287,462, Jul. 27, 1981, abandoned. This application Sep. 1, 1982, Ser. No. 414,090

Int. Cl.³ C08F 6/00, 8/26, 263/04, 259/02

U.S. Cl. 525—296 8 Claims

1. The method which comprises dehydrochlorinating a vinychloride resin selected from the group consisting of homopolyvinylchloride, a copolymer of vinylchloride and vinyl acetate containing up to about 50% by weight of vinyl acetate and a copolymer of vinylchloride and vinylidene chloride containing up to about 50% by weight of vinylidene chloride and mixtures thereof as finely divided particles suspended in water, by heating said resin in said water at from about 50 to 150 psi and at a temperature of from about 150° to 180° C. for from about 1 to 2 hours to remove not over about 3% by weight, or from about 1 to 2% by weight, of chlorine from said resin, said water containing dissolved therein from about 0.1 to 5 parts by weight per 100 parts by weight of said resin of a material to prevent agglomeration of said resin during dehydrochlorination and being selected from the group consisting

of a solid water soluble electrolyte and a weak base, where said electrolyte is selected from the group consisting of the lithium, sodium, potassium, magnesium, calcium, strontium and barium bromide, chloride and iodide salts and mixtures of the same, ammonium chloride and the sodium, potassium, lithium and magnesium acetates and where said weak base is selected from the group consisting of the lithium, sodium and potassium carbonates and phosphates and mixtures of the same, and, in said water, free radical aqueous graft suspension polymerizing on said dehydrochlorinated vinylchloride resin a monomer containing a polymerizable ethylenically unsaturated double bond and being selected from the group consisting of maides, nitriles, acrylates, alkacrylates, dienes and vinyl benzenes and mixtures thereof, said monomer being used in the amount of from about 50 to 200 parts by weight per 100 parts by weight of said dehydrochlorinated resin.

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**4,423,194**

## POLYQUATERNARY AMMONIUM COMPOUNDS, THEIR PREPARATION, THEIR USE IN THE PRODUCTION OF PAPER AND PAPER TREATMENT AGENTS CONTAINING THEM

**Wilfried Löbach, Bonn; Peter Haas, Haan; Günter Kolb; Güter Sackmann, both of Leverkusen, and Joachim Probst, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Continuation of Ser. No. 180,556, Aug. 22, 1980, abandoned. This application Aug. 23, 1982, Ser. No. 410,744**

**Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936239**

**Int. Cl.³ C08F *8/32***

**U.S. Cl. 525—327.6** **6 Claims**

1. A water-soluble polyquaternary compound obtained by reaction of:

(A) a copolymer of maleic anyhdride with an olefin selected from the group consisting of styrene, diisobutylene, isobutylene and propylene, said copolymer having a number average molecular weight of at least 10,000, with

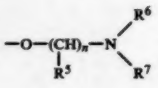
(B) an amine of the general formula

$$H_2N-(CH_2)_m-X$$

in which

m can be an integer between 2 and 5 and

X the formulae



(a)

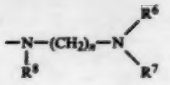
in which

n represents an integer between 2 and 5,

$R^5$ represents hydrogen of $C_1$- to $C_8$-alkyl which can be substituted by

and

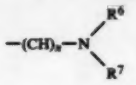
$R^6$ and $R^7$ independently of one another represent $C_1$- to $C_5$-alkyl, which can be substituted by hydroxyl, or together represent $C_2$- to $C_6$-alkylene,



(b)

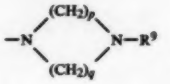
in which

$R^8$ represents $C_1$-$C_8$-alkyl or the radical



and

n, $R^6$ and $R^7$ have the above-mentioned meaning

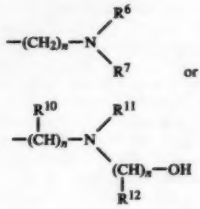


(c)

in which

p and q independently of one another stand for an integer between 2 and 5 and

$R^9$ represents $C_1$- to $C_8$-alkyl, which can be substituted by hydroxyl, or the radical



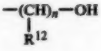
(d)

or

in which

$R^{10}$ and $R^{12}$ independently of one another represent hydrogen or $C_1$- to $C_8$-alkyl and

$R^{11}$ represents $C_1$- to $C_5$-alkyl or the radical



and;

(C) alkylation of the reaction product of said copolymer with said amine.

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**4,423,195**

## OCULAR MEMBRANE AND METHOD FOR PREPARATION THEREOF

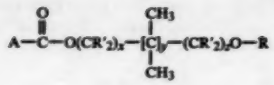
**William S. Covington, West Cornwall, Conn., assignor to Danker Laborstories, Inc., Parsippany, N.J.**

**Division of Ser. No. 973,818, Dec. 28, 1978, Pat. No. 4,245,069, which is a continuation-in-part of Ser. No. 677,246, Apr. 15, 1976, Pat. No. 4,169,119. This application Dec. 22, 1980, Ser. No. 218,950**

**Int. Cl.³ C08F *283/00***

**U.S. Cl. 525—479** **20 Claims**

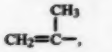
1. An ocular membrane formed from a composition comprising a uniform polymer selected from the group consisting of copolymers and terpolymers of an addition cross-linked polysiloxane and one or more esters having the formula:



(I)

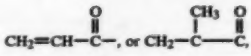
wherein:

A is $CH_2$=CH-or



R' may be the same or different in each occurence and may be hydrogen or methyl,

R is hydrogen, lower alkyl having one to three carbon atoms,



x and z are integers from 0 to 4,

y is 0 or 1,

the sum of x and z is one or more, and when y is 1, x and z are equal,

the amount of the ester in the polymer being effective to provide the composition with sufficent transparency, liphobicity, mucophobicity, and surface wettability, for wearing in contact with the human eye but less than that which would make the composition water swellable.

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**4,423,196**

## COPOLYMERS OF PROPYLENE AND ALLYL ALCOHOL

**Klaus-Peter Arlt, Senden; Rudolf Binsack, Krefeld; Ulrich Grigo, Krefeld, and Dieter Neuray, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Continuation of Ser. No. 122,575, Feb. 19, 1980, abandoned, which is a continuation-in-part of Ser. No. 110,790, Jan. 9, 1980, abandoned. This application Nov. 13, 1981, Ser. No. 321,277**

**Claims priority, application Fed. Rep. of Germany, Jan. 17, 1979, 2901646**

**Int. Cl.³ C08F *216/08, 220/62***

**U.S. Cl. 526—72** **1 Claim**

1. Copolymers of alpha-olefins having a melt flow index of from 2 to 20 g/10 ...inutes, said alpha-olefins being propylene and 1 to 50% by weight of allyl alcohol incorporated by polymerization.

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**4,423,197**

## CYCLIC PERFLUOROALIPHATIC-DISULFONIC ACID ANHYDRIDES AND SULFONAMIDE DERIVATIVES THEREOF

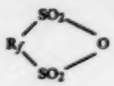
**Fred E. Behr, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Division of Ser. No. 326,422, Dec. 1, 1981, Pat. No. 4,386,214, which is a division of Ser. No. 229,871, Jan. 30, 1981, Pat. No. 4,329,478. This application Jan. 31, 1983, Ser. No. 462,668**

**Int. Cl.³ C08F *4/00*; C07C *143/74***

**U.S. Cl. 526—220** **10 Claims**

1. Sulfonamides, useful as latent catalysts for the polymerization of cationically-sensitive monomers, comprising the reaction product of at least one cyclic anhydride of perfluoroaliphaticdisulfonic acids, having the formula:



wherein $R_f$ is perfluoroalkylene having 2 to 5 catenary carbon atoms or perfluorocycloalkylene having 4 to 7 ring atoms, $R_f$ optionally being substituted by one or more straight chain, branched, or cyclic perfluoroalkyl groups of 1 to 12 carbon atoms, with $R_f$ having a total of up to 14 carbon atoms, together with at least one protonic nitrogenous base having a $pk_b$ of less than about 13.2.

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**4,423,198**

## HIGH GREEN STRENGTH SYNTHETIC RUBBERS AND METHOD

**Tom Tsai, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.**

**Continuation of Ser. No. 303,870, Sep. 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 208,570, Nov. 20, 1980, abandoned. This application Sep. 24, 1982, Ser. No. 422,881**

**Int. Cl.³ C08F *236/16, 236/18***

**U.S. Cl. 526—263** **18 Claims**

1. A method of producing synthetic rubbers characterized by high green strength and tack comprising interpolymerizing a rubber forming monomer selected from the group consisting of a diolefin selected from the group consisting of butadiene, 1,3-isoprene, piperylene, 2,3-dimethylbutadiene and said diolefin and an unsaturated monomer selected from the group consisting of styrene, alpha-methyl styrene, vinyl toluene, acrylonitrile and methacrylonitrile with one or more polymerizable unsaturated organic tertiary amines and one or more polymerizable unsaturated organic cross linking agents in the form of an organic compound containing active halogen groups in which the tertiary amine is incorporated with the polymerizable rubber forming monomers in an amount within the range of 0.5–100 millimoles per 100 grams of rubber forming monomers and in which the cross linking agent is incorporated in the ratio of 0.03–10.0 halogen mole atoms per mole of tertiary amine.

10. A synthetic rubber characterized by high green strength and tack comprising an interpolymer of rubber forming monomer selected from the group consisting of a diolefin selected from the group consisting of butadiene, 1,3-isoprene, piperylene, 2,3-dimethylbutadiene and said diolefin and an unsaturated monomer selected from the group consisting of styrene, alpha-methyl styrene, vinyl toluene, acrylonitrile and methacrylonitrile, an unsaturated polymerizable organic tertiary amine incorporated in an amount within the range of 0.5–100 millimoles per 100 grams of rubber forming monomers and a polymerizable unsaturated cross linking agent in the form of an organic compound having active halogen groups in the ratio of 0.03–10 halogen mole atoms per mole of the tertiary amine.

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**4,423,199**

## ACRYLAMIDE CONTAINING EMULSION COPOLYMERS FOR THICKENING PURPOSES

**Ching-Jen Chang, Chalfont, and Travis E. Stevens, Ambler, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**Filed Sep. 30, 1982, Ser. No. 431,880**

**Int. Cl.³ C08F *20/54***

**U.S. Cl. 526—307.6** **22 Claims**

1. A copolymer polymerized from a monomer system comprising

(I) at least about 10 weight percent of a monomer or a mixture of monomers selected from the group consisting of methacrylic acid, itaconic acid, acrylic acid, acryloxypropionic acid, fumaric acid, maleic acid, citraconic acid and crotonic acid;

(2) about 0.5 to 25 weight percent of at least one monomer of the formula:

$H_2C{=}CH{-}C(O){-}NH{-}R$

wherein:

R is selected from the group consisting of alkyl, alkylaryl, and polycyclic alkyl groups having 8 to 30 carbon atoms;

(3) optionally at least one copolymerizable ethylenically unsaturated monomer selected from the group consisting of compounds of the formula

$H_2C{=}CYZ$

wherein

(a) Y is H and Z is COOR'', $C_6H_4R'''$, CN, Cl, $CONH_2$, $OC(O)R''''$ or $CH{=}CH_2$;

(b) Y is $C_1$–$C_4$ alkyl and Z is COOR'', $C_6H_4R''''$, CN, $CONH_2$, or $CH{=}CH_2$; or

(c) Y and Z are Cl; and

R'' is $C_1$–$C_8$ alkyl or $C_2$–$C_8$ hydroxyalkyl or lower alkoxy($C_2$–$C_8$)alkyl;

R''' is H, Cl, Br, or $C_1$–$C_4$ alkyl; and

R'''' is $C_1$–$C_8$ alkyl; and

(4) zero to 1.0 weight percent of a polyethylenically unsaturated monomer.

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**4,423,200**

## PROCESS FOR THE PRODUCTION OF POLYURETHANE UREA PRODUCTS

**Otto Ganster, Leverkusen, and James M. Barnes, Wermelskirchen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Dec. 23, 1982, Ser. No. 452,575**

**Claims priority, application Fed. Rep. of Germany, Jan. 9, 1982, 3200412**

**Int. Cl.³ C08G *18/79, 18/32***

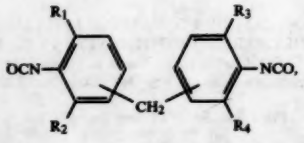
**U.S. Cl. 528—67** **9 Claims**

1. A process for the production of polyurethane urea products by reacting

(A) an isocyanate blend comprising

(a) an NCO-prepolymer which is substantially monomer-free and which is produced by reacting substantially linear, relatively high molecular weight polyhydroxyl compounds which have molecular weights of from 440 to 12,000, with toluene diisocyanate, phenylene diisocyanate, hexamethylene diisocyanate or a combination of these diisocyanates, in an NCO:OH ratio of greater than 1.1:1, and

(b) from 0.1 to 25%, by weight, of diphenylmethane diisocyanates which are tetra-alkyl-substituted in o-positions to the NCO-groups which correspond to the general formula:



wherein

$R_1$, $R_2$, $R_3$ and $R_4$, which may be the same or different represent straight- or branched-chain alkyl radicals having from 1 to 4 carbon atoms, with

(B) chain-lengthening aromatic diamines in quantities of from 0.8:1 to 1.2:1 of isocyanate to isocyanate-reactive groups to prepare said polyurethane urea products.

**4,423,201**

## CO-REACTIVE URETHANE SURFACTANTS AND STABLE AQUEOUS EPOXY DISPERSIONS

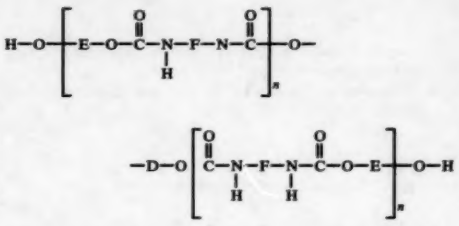
**Darrell D. Hicks, Jeffersontown, Ky., assignor to Celanese Corporation, New York, N.Y.**

**Filed Oct. 29, 1982, Ser. No. 437,706**

**Int. Cl.³ C08G *18/32***

**U.S. Cl. 528—76** **22 Claims**

1. A co-reactive surfactant for epoxide resins having the general formula



wherein D is the residue of a long-chain aliphatic polyether glycol, F is the residue of a diisocyanate and E is the residue of a dihydric phenol, and wherein n is 1–3.

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**4,423,202**

## PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT PARA ORDERED AROMATIC HETEROCYCLIC POLYMER

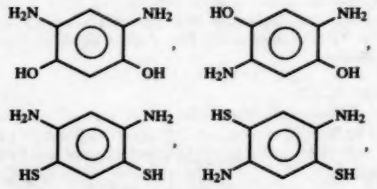
**Eui W. Choe, Randolph, N.J., assignor to Celanese Corporation, New York, N.Y.**

**Filed May 5, 1981, Ser. No. 260,573**

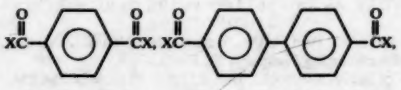
**Int. Cl.³ G08G *73/06, 73/22***

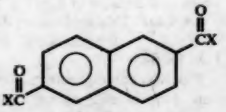
**U.S. Cl. 528—179** **27 Claims**

1. A process for the production of para ordered heterocyclic polymer having a number average molecular weight of at least approximately 10,000 which comprises heating a first reactant selected from the group consisting of



their dihydrochloride salts and mixtures thereof with at least one dihalogen derivative selected from the group consisting of





wherein X is F, Cl, Br or I, in polyphosphoric acid at a temper-

ature within the range of approximately 100° C. to 250° C. until the polymerization reaction is complete.

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**4,423,203**

## ELECTRICALLY PHOTOSENSITIVE POLYMERS CONTAINING VINYLENE-1,4-PHENYLENE-IMINO-1,4-PHENYLENE-VINYLENEARYLENE GROUPS

**Peter J. Corvan; Jeanne E. Kaeding, both of Rochester, N.Y.; Cesar Rodriguez, Boston, Mass., and Norman G. Rule, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Aug. 20, 1982, Ser. No. 409,800**
**Int. Cl.³ C08G 12/04**
**U.S. Cl. 528—266** **3 Claims**

1. An electrically photosensitive polymer in which recurring units comprise a vinylene-1,4-phenylene-imino-1,4-phenylene-vinylenearylene group.

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**4,423,204**

## AMORPHOUS COPOLYAMIDE FROM LACTAM, DICARBOXYLIC ACID AND BISIMIDAZOLINE

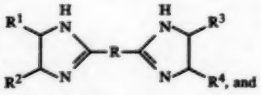
**Edward A. Barsa, East Haven, and Kemal Onder, North Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.**

**Filed Sep. 2, 1982, Ser. No. 414,507**
**Int. Cl.³ C08G 69/14**
**U.S. Cl. 528—323** **14 Claims**

1. An amorphous moldable copolyamide comprising the reaction product of,

A. a lactam having the formula

B. a bisimidazoline having the formula



C. a dicarboxylic acid having the formula

$$HOOC-R^5-COOH$$

wherein $C_nH_{2n}$ is alkylene having from 5 to 11 carbon atoms in the chain, R is a diradical selected from the group consisting of 1,3-arylene, alkylene having 1 to 12 carbon atoms, inclusive, and cycloalkylene, $R^1$, $R^2$, $R^3$, and $R^4$ are independently selected from the group consisting of hydrogen and inert substituents, and $R^5$ is a diradical selected from the group consisting of 1,3-arylene, alkylene having 4 to 12 carbon atoms, inclusive, and cycloalkylene, provided at least one of the diradicals R and $R^5$ is 1,3-arylene and wherein the proportions of reactants based on 100 mole percent are from about 43 to about 82 mole percent of said lactam and the remaining 18 to 57 mole percent divided between said bisimidazoline and said dicarboxylic acid in substantially equimolar proportions.

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**4,423,205**

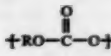
## CATIONIC POLYMERIZATION OF CYCLIC CARBONATES

**Sundar J. Rajan, Ferndale, Mich., assignor to Ethyl Corporation, Richmond, Va.**

**Filed May 24, 1982, Ser. No. 381,207**
**Int. Cl.³ C08G 63/62**
**U.S. Cl. 528—371** **17 Claims**

1. A process for the production of a polycarbonate glycol, said process comprising heating a cyclic carbonate in the presence of a catalytic amount of a cationic initiator.

11. A process for the production of a polycarbonate glycol containing units of



said process comprising heating a cyclic carbonate of structure I:

(I)

in the presence of a cationic initiator, where R is an alkylene group of 2 or more carbons, and R′ and R″ are independently hydrogen, alkyl, alkaryl, aralkyl, or aryl.

16. The polycarbonate glycol product formed by the process of claim 11.

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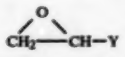
**4,423,206**

## VICINAL ALKYLENE OXIDE POLYMERIZATION

**David L. Wolfe, Midland, Mich., and Frederick P. Corson, Miami, Fla., assignors to The Dow Chemical Co., Midland, Mich.**

**Division of Ser. No. 274,135, Jun. 16, 1981, Pat. No. 4,376,723. This application Jun. 21, 1982, Ser. No. 390,017**
**Int. Cl.³ C08G 65/12**
**U.S. Cl. 528—416** **8 Claims**

1. A process for the polymerization of a vicinal alkylene oxide represented by the formula



where Y represents $R_1$ or $CH_2OR_2$; $R_1$ represents H, an aliphatic hydrocarbyl group of about 1 to 20 carbon atoms, a chloromethyl or a bromomethyl group; and $R_2$ represents the acyl residue of a carboxylic or fatty acid of about 1 to 30 carbon atoms or a hydrocarbyl group of about 1 to 20 carbon atoms which may bear other vicinal alkylene oxide groups or inert substituents; said process comprising contacting said vicinal alkylene oxide with a catalytically effective amount of a catalyst comprising a composition prepared by contacting:

Component A, a compound represented by the formula RR′AlX wherein R and R′ each independently represent an alkyl group of 1 to 4 carbon atoms, and X represents hydrogen or an alkyl or alkoxy group of 1 to 4 carbon atoms;

Component B, an organic nitrogen base compound selected from secondary nitrogen-containing compounds having basicity about equal to or less than the basicity of dimethylamine and having no active hydrogen atoms other than those of the secondary nitrogen;

Component C, a beta-diketone; and

Component D, water;

in the molar ratios of

B:A—about 0.01 to 2.5:1

C:A—about 0.1 to 1.5:1

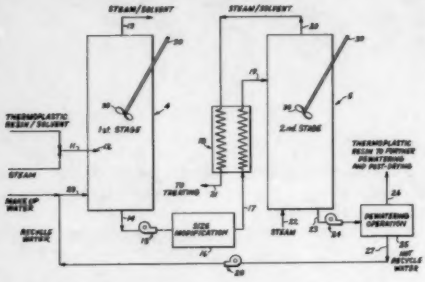
D:A—about 0.1 to 1.5:1

provided that when the molar ratio of (C+2D):A is greater than about 3:1 then the B:A molar ratio is at least about 1:1.

## 4,423,207
## PROCESS FOR RECOVERY OF SOLID THERMOPLASTIC RESINS FROM SOLUTIONS THEREOF IN ORGANIC SOLVENTS

John W. Flock; Stephen L. Matson, both of Schenectady, N.Y., and Peter H. Bollenbeck, Mt. Vernon, Ind., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 217,603, Dec. 18, 1980, abandoned. This application Feb. 23, 1982, Ser. No. 351,381
Int. Cl.³ C08G 63/70, 65/46
U.S. Cl. 528—499 16 Claims




1. A process for recovering a thermoplastic polycarbonate or polyphenylene oxide resin from a solution of said resin in a solvent comprising introducing said solvent solution into a first separation vessel by a first conduit means terminated with atomizing means in communication with an intermediate region of said first separation vessel and below the surface of the liquid contained therein, removing a mixture of solvent and water vapor as an overhead product from said first separation vessel, condensing said overhead product and passing the condensate to a solvent recovery apparatus, removing a bottom product comprising a slurry mixture of a thermoplastic resin, solvent and water and passing said bottom product to subsequent separation stages for further solvent and water removal.

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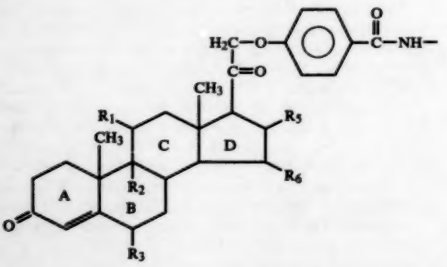
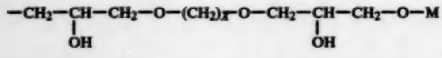
## 4,423,208
## AFFINITY GEL-ADSORBENT

Peter Grandics, 260 S. 16th St., Philadelphia, Pa. 19102

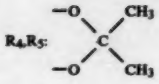
Filed Feb. 24, 1982, Ser. No. 352,013
Int. Cl.³ C07J 17/00
U.S. Cl. 536—5 7 Claims

1. An improved affinity gel-adsorbent having the formula:

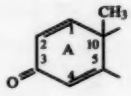



$R_1$: H or OH or=O
$R_2$: H or F
$R_3$: H or F
$R_4$: OH or H
$R_5$: OH or H




$R_6$: H or $CH_3$
X: 1 through 8
M: Matrix




Alternative A ring with Δ1,2 double bond.
wherein M is a polysaccharide matrix including agarose, dextran, and cellulose.

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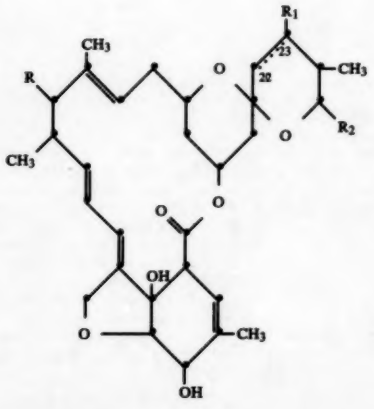
## 4,423,209
## PROCESSES FOR THE INTERCONVERSION OF AVERMECTIN COMPOUNDS

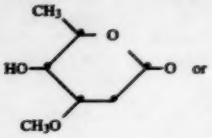
Helmut H. Mrozik, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 26, 1982, Ser. No. 352,666
Int. Cl.³ C07H 17/08; C07D 313/00
U.S. Cl. 536—7.1 4 Claims

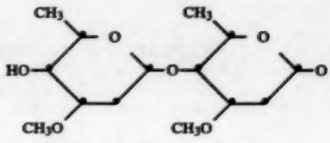
1. A process for the preparation of a compound having the formula:



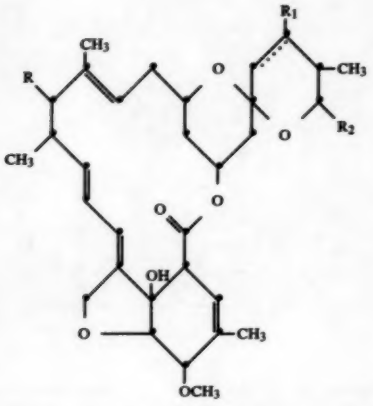

wherein
the broken line at the 22,23-position indicates a single or a double bond, provided that the double bond is present only when $R_2$ is iso-propyl or sec-butyl;
$R_1$ is hydrogen or hydroxy, provided $R_1$ is hydroxy only when the broken line indicates a single bond;
$R_2$ is methyl, ethyl, sec-butyl or isopropyl; and
R is hydrogen, hydroxy.



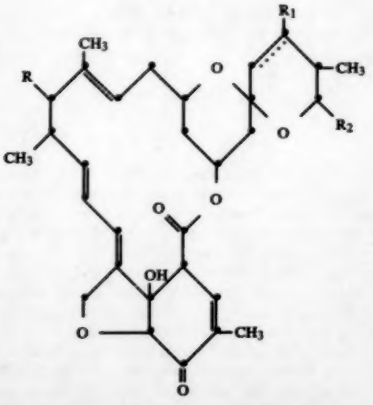
or



which comprises treating a compound having the formula:



wherein R, $R_1$ and $R_2$ are as previously defined, with mercuric acetate and hydrolyzing the thus produced 3-acetoxy enol ether with a mild acid to produce a 5-keto compound having the formula:



which is reduced with sodium borohydride, tri-t-butoxy aluminum hydride or lithium aluminum hydride to produce the desired compound.

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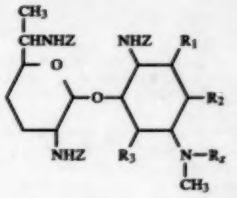
**4,423,210**

## INTERMEDIATES FOR THE PREPARATION OF 3-DEMETHOXYFORTIMICINS

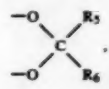
**James B. McAlpine, Libertyville, and Ronald E. Carney, Gurnee, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.**

**Filed Apr. 9, 1982, Ser. No. 366,797**
**Int. Cl.³ A61K *31/71*; C07H *15/22***
**U.S. Cl. 536—16.1** **12 Claims**

1. A compound of the formula



wherein $R_z$ is a monocyclicaryloxycarbonyl amine protecting group, or is loweralkyl, hydroxyloweralkyl, loweracyl, hydroxyloweracyl, or a monocyclicaryloxycarbonyl-protected aminoloweralkyl, diaminoloweralkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, aminohydroxyloweralkyl, N-loweralkylaminohydroxyloweralkyl, N,N-diloweralkylaminohydroxyloweralkyl, aminoloweracyl, diaminoloweracyl, N-loweralkylaminoloweracyl, N,N-diloweralkylaminoloweracyl, or aminohydroxyloweracyl; $R_1$ is hydroxy or loweracyloxy; $R_2$ is hydrogen or —$OR_4$, wherein $R_4$ is tert-butyldimethylsilyl or thiocarbonylimidazoyl; or $R_1$ and $R_2$ can be taken together to form



wherein $R_5$ and $R_6$ are loweralkyl; $R_3$ is hydroxy or loweracyloxy; and Z is a monocyclicaryloxycarbonyl amine protecting group.

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**4,423,211**

## PROCESS FOR THE WHOLE BROTH EXTRACTION OF AVERMECTIN

**Carl Bagner, Paramus, and Arthur S. Wildman, Martinsville, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**Filed Dec. 21, 1981, Ser. No. 332,418**
**Int. Cl.³ C07H *1/08***
**U.S. Cl. 536—16.9** **10 Claims**

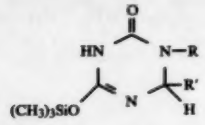
1. A process for separating an avermectin rich fraction from an avermectin containing whole fermentation broth comprising acidifying the whole broth to a pH of from 1.5 to 6; admixing the acidified whole broth with an extractant in which the avermectins are soluble selected from toluene, xylene, benzene, chlorotoluene, chlorobenzene and alcohols of from 4 to 8 carbon atoms in a ratio of extractant to broth of from 0.2 to 3 in volume; heating the admixture of whole broth and extractant to a temperature of from about 20° C. to 100° C. or to the reflux temperature of the extractant in a first stage for a period of at least 1 hour; decanting the avermectin containing extractant fraction from the admixture; stripping the extractant from the avermectin containing extractant fraction; and collecting the avermectin.

## 4,423,212
## NUCLEOSIDES AND PROCESS

Harvey I. Skulnick, Oshtemo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 18, 1980, Ser. No. 217,935
Int. Cl.³ C07H *19/06, 17/02*
U.S. Cl. 536—23 34 Claims

1. The chemical process which comprises reacting a monosilyl compound of the formula:



wherein R is selected from the group consisting of hydrogen, lower alkyl of 1 through 4 carbon atoms, and cyclopropyl and R′ is selected from the group consisting of hydrogen and lower alkyl of 1 through 4 carbon atoms; with a 2-deoxy-3,5-blocked-D-pentofuranosyl halide in the presence of a Lewis acid and a solvent selected from the group consisting of acetonitrile or nitromethane at a temperature of about minus (−) 25° C. with subsequent warming to about 25° C.; to form a 1-(2-deoxy-3,5-di-O-blocked-D-pentofuranosyl)-5-R-6-R′-5,6-dihydro-s-triazine-2,4-(1H,3H)-dione.

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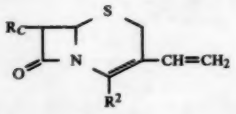
## 4,423,213
## 7-ACYLAMINO-3-VINYLCEPHALOSPORANIC ACID DERIVATIVES AND PROCESSES FOR THE PREPARATION THEREOF

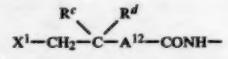
Takao Takaya, Kawanishi; Hisashi Takasugi, Osaka; Takashi Masugi, Ikeda; Hideaki Yamanaka, Hirakata, and Kohji Kawabata, Sumiyoshi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 205,334, Nov. 10, 1980. This application May 7, 1981, Ser. No. 261,618
Claims priority, application United Kingdom, Nov. 19, 1979, 7939985; Feb. 8, 1980, 8004335; Apr. 21, 1980, 8012991; Jul. 14, 1980, 8022920
Int. Cl.³ C07D *501/22*
U.S. Cl. 544—16 9 Claims

1. A compound of the formula:



in which $R_c$ is a group of the formula:



wherein $A^{12}$ is methylene wherein the carbon thereof has attached a group of the formula:

$$=N-OR^4$$

wherein $R^4$ is hydrogen, cyclo(lower)alkenyl, lower alkynyl, lower alkenyl, lower alkenyl substituted by carboxy or a protected carboxy group, lower alkyl, or lower alkyl substituted by one or more substituents selected from carboxy, a protected carboxy group, amino, a protected amino group, cyano, phosphono, a protected phosphono group, a heterocyclic group, and a heterocyclic group substituted by one or more substituents selected from lower alkyl, lower alkoxy, lower alkylthio, lower alkylamino, cyclo(lower)alkyl, cyclo(lower)alkenyl, hydroxy, halogen, amino, protected amino, cyano, nitro, carboxy, protected carboxy, sulfo, sulfamoyl, imino, oxo and amino(lower)alkyl,

$R^c$ and $R^d$ combined together form oxo or a protected oxo group selected from di(lower)alkoxy and lower alkylenedioxy,

$X^1$ is halogen, and

$R^2$ is carboxy or a protected carboxy group, or a salt thereof.

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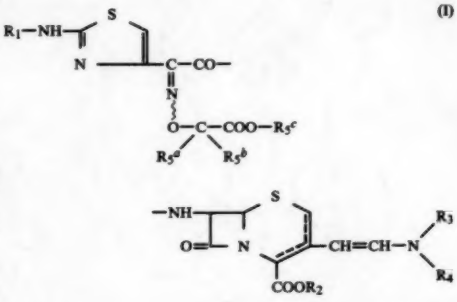
## 4,423,214
## 3-VINYLCEPHALOSPORIN DERIVATIVES

Daniel Farge; Pierre L. Roy, both of Thiais; Claude Moutonnier, Le Plessis Robinson, and Jean-Francois Peyronel, Palaiseau, all of France, assignors to Rhone-Poulenc Industries, Paris, France

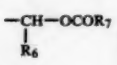
Filed Nov. 19, 1981, Ser. No. 322,949
Claims priority, application France, Nov. 20, 1980, 80 24634
The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.
Int. Cl.³ C07D *501/24*
U.S. Cl. 544—22 4 Claims

1. A 3-vinylcephalosporin of the formula:



(I)

in the form of a bicyclooct-2-ene or bicyclooct-3-ene in which the substituent in the 3-position of the bicyclooctene is in the E or Z form or a mixture thereof; and the imine group of the substituent in the 7-position is in the syn or anti form or a mixture thereof; wherein $R^a_5$ and $R^b_5$, which are identical or different, represent hydrogen atoms or alkyl radicals, or together form an alkylene radical containing 2 or 3 carbon atoms; $R^c_5$ represents an acid-protecting radical; $R_1$ represents an amine-protecting radical; $R_2$ represents a radical which can easily be removed by an enzymatic method having the formula:



(II)

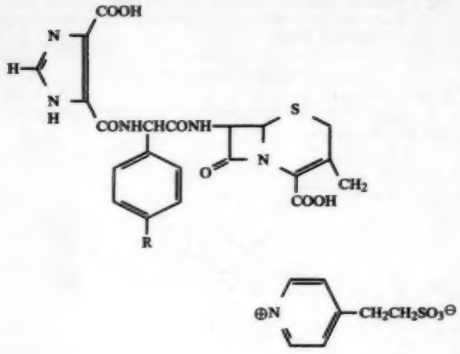
in which $R_6$ represents a hydrogen atom or an alkyl radical and $R_7$ represents an alkyl radical or the cyclohexyl radical, or $R_2$ represents a methoxymethyl, t-butyl, benzhydryl, p-nitrobenzyl or p-methoxybenzyl radical; and the symbols $R_3$ and $R_4$, which are identical or different, represent alkyl radicals, which are unsubstituted or substituted by a hydroxyl, alkoxy, amino, alkylamino or dialkylamino radical, or phenyl radicals, or together form, with the nitrogen atom to which they are attached, a saturated heterocyclic ring of 5 or 6 ring members, which may contain another hetero-atom chosen from nitrogen, oxygen and sulphur, and is unsubstituted or substituted by an alkyl radical, the abovementioned alkyl portions or radicals being (unless otherwise mentioned) straight or branched and containing 1 to 4 carbon atoms.

## 4,423,215
## METHOD OF PREPARING SODIUM SALTS OF IMIDAZOLEDICARBOXYLIC ACID SUBSTITUTED CEPHALOSPORIN DERIVATIVES

Naohiko Yasuda, Yokosuka; Hisao Iwagami, Kawasaki; Yasuo Irie, Kawasaki; Eiji Nakanishi, Kawasaki, and Hideomi Saito, Sagamihara, all of Japan, assignors to Ajinomoto Company, Inc., Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 353,809
Claims priority, application Japan, Mar. 2, 1981, 56-29541
Int. Cl.³ C07D 501/38
U.S. Cl. 544—025 2 Claims

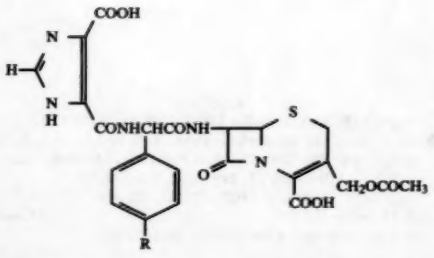
1. A method of preparing sodium salts of imidazoledicarboxylic acid derivatives of substituted cephalosporins having the formula:



R: H, OH

comprising:

reacting a compound of the formula:



R: H, OH

wherein R is hydrogen or hydroxyl, with 4-pyridineethanesulfonic acid in an aqueous solution of sodium iodide at pH 6.0 to 7.5;

contacting the reaction solution with a hydrophilic organic solvent selected from the group consisting of $C_1$–$C_4$ alcohols, acetone, acetonitrile and mixtures thereof to precipitate the sodium salt of the imidazoledicarboxylic acid reaction product; and

separating said precipitated sodium salt from the remainder of the reaction mixture.

## 4,423,216
## PREPARATION OF CYANURIC ACID

John A. Wojtowicz, Cheshire, and Haywood Hooks, West Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Dec. 24, 1981, Ser. No. 334,208
Int. Cl.³ C07D 251/32
U.S. Cl. 544—192 37 Claims

1. In a process for making cyanuric acid by pyrolyzing a nitrogenous material capable of yielding a cyanuric acid product, said material being dissolved in an N-methylpyrrolidone solvent in a pyrolysis vessel to produce a hot reaction mass comprising a slurry of crude cyanuric acid product suspended in said solvent, characterized by the improvements which comprise:

a. adding said nitrogenous material to said pyrolysis vessel in a gradual controlled manner wherein the rate for said gradual addition is from about 0.1 to about 1.15 pounds of nitrogenous material/hour/pound of solvent; and

b. maintaining said reaction mass at a temperature in excess of about 100° C. during recovery of said cyanuric acid from said reaction mass.

## 4,423,217
## PROCESS FOR THE PRODUCTION OF HETEROCYCLIC THIO COMPOUNDS

Laurent Duc, Yverdon; Karl-Josef Boosen, Erlach, and Jean-François Marrel, Yverdon, all of Switzerland, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 20, 1981, Ser. No. 236,577
Claims priority, application Switzerland, Feb. 28, 1980, 1590/80; Dec. 5, 1980, 8987/80
Int. Cl.³ C07D 207/36, 239/58, 473/20, 215/36
U.S. Cl. 544—267 8 Claims

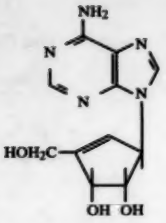
1. Process for the production of a heterocyclic thio compound having the formula Het-S-R, wherein R is H, or a lower alkyl residue and wherein Het is a heterocyclic residue selected from the group consisting of pyrrolidyl, furyl, triazolyl, pyridyl, pyrimidyl, triazinyl, purinyl, carbazolyl, acridyl, 1,4-benzisoxazinyl, chromonyl, guanyl, quinolyl, isoquinolyl, quinazolyl, naphthyridyl, pyrido [3,4-b] pyridyl, coumaryl, benzoxazolyl, indolyl, thiophenyl, benzothiazolyl, pyrrolyl, thiazolinyl and thiazolyl, from the corresponding amino compound, which comprises reacting the corresponding heterocyclic amino compound, having the formula Het-$NH_2$, Het-NHR or Het-$NR_2$, with a monocarboxylic acid having 1 to 4 C-atoms, a dicarboxylic acid having 1 to 4 C-atoms or a sulfonic acid, the corresponding amino salt resulting, and reacting, and reacting the corresponding amino salt with a compound having the formula HSR, wherein R has the above-stated meaning, at a temperature of 80° to 180° C., the heterocyclic thio compound resulting.

## 4,423,218
## ANTIBIOTIC NEPLANOCIN A

Masaru Otani; Satoshi Yaginuma; Masatoshi Tsujino; Naoki Muto; Tetsu Saito, all of Shizuoka, and Tadashiro Fujii, Mishima, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 18,790, Mar. 8, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 205,350
Claims priority, application Japan, May 25, 1978, 53-62899; Aug. 10, 1978, 53-98027; Jan. 29, 1979, 54-8295
The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.
Int. Cl.³ C07D 473/32
U.S. Cl. 544—277 1 Claim

1. Antibiotic neplanocin A of the formula



or a pharmaceutically acceptable salt thereof.

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4,423,219

## PRODUCTION OF PURINE DERIVATIVES AND INTERMEDIATES THEREFOR

Kin-ichi Imai, Toyonaka, and Mitsuhiko Mano, Suita, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 4, 1981, Ser. No. 318,277
Claims priority, application Japan, Nov. 14, 1980, 55-161099; Aug. 18, 1981, 56-129518
Int. Cl.³ C07D 239/50
U.S. Cl. 544—326 1 Claim

1. 6-(2-chloro-6-fluorobenzyl)amino-4-methylamino-5-phenylazopyrimidine or an acid addition salt thereof.

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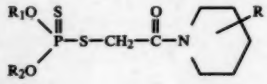
4,423,220

## PROCESS FOR THE PRODUCTION OF O,O-DIALKYLPHOSPHORODITHIOATES

Jean-Pierre Ledouble, St. Louis, France, and Markus Tschopp, Liestal, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 636,780, Dec. 1, 1975, abandoned. This application Nov. 26, 1979, Ser. No. 97,592
Int. Cl.³ C07F 9/65
U.S. Cl. 546—22 9 Claims

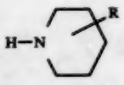
1. In the production of an O,O-disubstituted phosphorodithioate of the formula:



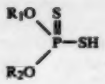
wherein

R is methyl or ethyl and

each of $R_1$ and $R_2$, independently of the other, is alkyl, alkenyl or alkoxyalkyl having a maximum total of 5 carbon atoms, the improvement permitting said production directly which comprises simultaneously bringing into contact under reactive conditions essentially equimolar amounts of the reactants (a) chloroacetyl chloride, (b) a methyl- or ethylpiperidine of the formula:



wherein R is as herein defined, and (c) a source of the anion of an O,O-disubstituted dithiophosphoric acid of the formula:



wherein $R_1$ and $R_2$ are as herein defined, in the presence of at least an essentially equimolar amount of an acid binding agent.

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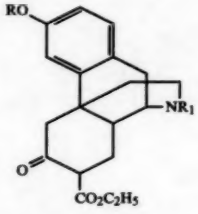
4,423,221

## 7-CARBOETHOXY-MORPHINAN-6-ONE COMPOUNDS

Raj K. Razdan, Belmont, and Haldean C. Dalzell, Weston, both of Mass., assignors to S/SA Pharmaceutical Laboratories, Inc., Cambridge, Mass.

Filed Jun. 10, 1982, Ser. No. 386,921
Int. Cl.³ C07D 221/28; A61K 31/485
U.S. Cl. 546—74 11 Claims

1. 7-carboethoxy-morphinan-6-one compounds characterized by the formula:



wherein R is H or methyl and $R_1$ is methyl, cyclopropylmethyl, cyclobutylmethyl, propargyl, allyl, dimethylallyl or furfuryl.

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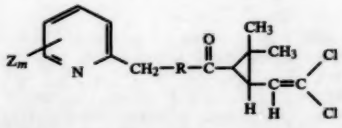
4,423,222

## PYRIDINYL FUNGICIDES AND HERBICIDES

Mary L. Ash, and Richard G. Pews, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 21, 1982, Ser. No. 380,644
Int. Cl.³ C07D 213/61, 213/40
U.S. Cl. 546—337 2 Claims

1. A compound represented by the formula:



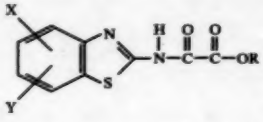
wherein, R is imino (—NH—); each Z is independently selected from the group consisting of chlorine, bromine, fluorine, and iodine; and m is an integer of from zero to four, both inclusive.

## 4,423,223
## BENZOTHIAZOLE DERIVATIVES

Charles M. Hall, and John B. Wright, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 2,803, Jan. 11, 1979, abandoned, which is a continuation of Ser. No. 753,717, Dec. 23, 1976, Pat. No. 4,150,140. This application Jun. 2, 1980, Ser. No. 155,712
The portion of the term of this patent subsequent to Apr. 17, 1996, has been disclaimed.
Int. Cl.³ C07D 277/62
U.S. Cl. 548—163 16 Claims

1. A compound of the formula



wherein X and Y are the same or different and are hydrogen, fluoro, chloro, bromo, alkyl of one to six carbon atoms, inclusive, alkoxy of one to six carbon atoms, inclusive, nitro, cyano, amino, trifluoromethyl,

wherein $R_1$ is alkyl of one to six carbon atoms, inclusive,

wherein $R_2$ and $R_3$ are the same or different and are hydrogen or alkyl of one to three carbon atoms, inclusive, or $CO_2Q$ where Q is alkyl of one to six carbon atoms, inclusive, hydrogen or a physiologically acceptable metal or amine cation with the proviso that when R is alkyl of two carbon atoms, one of X or Y is other than hydrogen; and

R is hydrogen, alkyl of one to eight carbon atoms, inclusive, $-(CH_2)_m$ phenyl wherein M is 0, 1 or 2 $(CH_2)_nNH_4R_5$ wherein n is 1 or 2, and $R_4$ and $R_5$ are the same or different and are alkyl of one to three carbon atoms, inclusive, and a physiologically acceptable metal or amine cation, and physiologically acceptable acid addition salts thereof.

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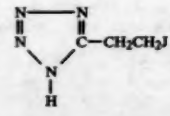
## 4,423,224
## 4-ME-1-(2-(1H-TETRAZOL-5-YL)ETHYL)BENZENE SULFONATE AND N-2-(1H-TETRAZOL-5-YL)ETHYL METHANESULFONAMIDE

Paul E. Marecki, Painesville, and John M. Weaver, Mentor, both of Ohio, assignors to SDS Biotech Corporation, Painesville, Ohio

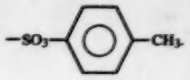
Filed Sep. 8, 1980, Ser. No. 185,171
Int. Cl.³ C07D 257/04
U.S. Cl. 548—252 2 Claims

1. A compound selected from the group consisting of:



I.

where J represents —$NHSO_2CH_3$ or



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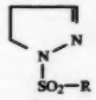
## 4,423,225
## PROCESS FOR THE PREPARATION OF PYRAZOLE

Reinhard Lantzsch, Leverkusen; Klaus Ditgens, Wuppertal; Ulrich Heinemann, Wuppertal; Rudolf Thomas, Wuppertal, and Erhard Weber, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 8, 1981, Ser. No. 300,320
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 3035394
Int. Cl.³ C07D 231/12
U.S. Cl. 548—373 18 Claims

1. Process for the preparation of pyrazole which comprises heating a pyrazoline derivative of the formula



(I)

wherein R is optionally substituted phenyl or alkyl or haloalkyl without the addition of an acid or base, at a temperature between 100° and 200° C. and under a pressure between 1 mbar and 10 bars.

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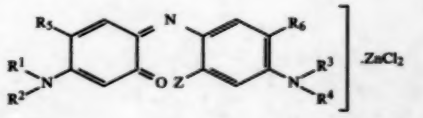
## 4,423,226
## ZINC CHLORIDE COMPLEX COMPOUNDS

Reinhard Mohr, Offenbach am Main, and Rudolf Neeb, Oberthausen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 16, 1981, Ser. No. 243,876
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011154
Int. Cl.³ C07D 209/82; C07F 3/06
U.S. Cl. 548—402 1 Claim

1. A zinc chloride complex compound corresponding to the general formula (I)



(I)

wherein:

$R^1$ is hydrogen or lower alkyl unsubstituted or substituted by chlorine, hydroxy, lower alkoxy, cyano, lower alkanoyloxy, carbamoyl or phenyl,

$R^2$ is hydrogen or lower alkyl unsubstituted or substituted by chlorine, hydroxy, lower alkoxy, cyano, lower alkanoyloxy, carbamoyl or phenyl, or is phenyl unsubstituted or substituted by substituents belonging to the group comprising chlorine, lower alkyl, lower alkoxy, carbamoyl, sulfamoyl, carbamoyl monosubstituted or disubstituted by lower alkyl, and sulfamoyl monosubstituted or disubstituted by lower alkyl,

$R^3$ is hydrogen or lower alkyl unsubstituted or substituted by chlorine, hydroxy, lower alkoxy, cyano, lower alkanoyloxy, carbamoyl or phenyl,

$R^4$ is hydrogen, lower alkyl unsubstituted or substituted by

chlorine, hydroxy, lower alkoxy, cyano, lower alkanoyloxy, carbamoyl or phenyl, or is phenyl unsubstituted or substituted by substituents belonging to the group comprising chlorine, lower alkyl, lower alkoxy, carbamoyl, sulfamoyl, carbamoyl monosubstituted or disubstituted by lower alkyl, and sulfamoyl monosubstituted or disubstituted by lower alkyl,

$R^5$ is hydrogen, halogen, lower alkyl or lower alkoxy, or $R^1$ and $R^5$ together form the o-phenylene,

$R^6$ is hydrogen, halogen, lower alkyl or lower alkoxy,

Z is lower alkoxy or lower alkoxy substituted by cyano, or is acyloxy, acylamino, lower alkylamino or lower dialkylamino.

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**4,423,227**

**PROCESS FOR THE PREPARATION OF REACTIVE, COUPLABLE DERIVATIVES OF THE THYROID HORMONES**

**Hans-Georg Batz, Tutzing; Winfried Albert, Pähl; Helmut Lenz, Tutzing; Hans-Ralf Linke, Raisting, and Fritz Stähler, Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany**

**Filed Sep. 30, 1981, Ser. No. 307,141**

**Claims priority, application Fed. Rep. of Germany, Oct. 7, 1980, 3037858**

**Int. Cl.³ C07F *7/10***

**U.S. Cl. 548—406** **11 Claims**

1. Process for the preparation of reactive, couplable derivatives of the thyroid hormones 3,3',5-triidothyronine ($T_3$) and 3,3',5,5'-tetraiodothyronine ($T_4$) by reaction with reactive carboxylic acid derivatives, which process comprises sylylating all the functional groups of the thyroid hormone by reaction with a reactive triorganosylyl derivative and then reacting the persylylated derivative of the thyroid hormone thus obtained with an activated carboxylic acid derivative.

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**4,423,228**

**PROCESS FOR PREPARING N-(METHYL-SULFONYL)-1,2,8,8A-CYCLOPROPA[c]BENZO[1,2-b:4,3-B]DIPYRROL-4(5H)-ONE**

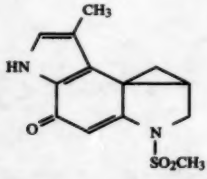
**Wendell Wierenga, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 207,838, Nov. 18, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 346,460**

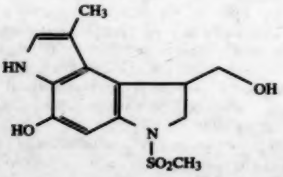
**Int. Cl.³ C07D *487/04***

**U.S. Cl. 548—421** **1 Claim**

1. A process for preparing a compound of the formula



which comprises reacting a compound of the formula



with triphenylphosphine/carbon tetrahalide, concentrating the reaction mixture in vacuo to a concentrate, applying said concentrate to a thick-layer silica gel plate, and eluting the desired compound therefrom with a non-polar organic solvent in which the desired compound is soluble.

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**4,423,229**

**COMPOSITION OF MATTER AND PROCESS**

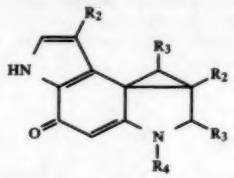
**Wendell Wierenga, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 207,838, Nov. 18, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 346,461**

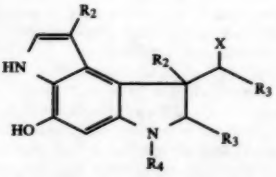
**Int. Cl.³ C07C *487/02*; A01N *43/38***

**U.S. Cl. 548—421** **1 Claim**

1. A process for preparing a compound of the formula



wherein $R_2$ and $R_3$ are hydrogen, alkyl of from 1 to 5 carbon atoms, inclusive, and phenyl; $R_4$ is selected from the group consisting of $SO_2R_2$, $SO_2CH_2COphenyl$, $CO_2CH_2Z$ where Z is selected from the group consisting of $CH_2I$, $CCl_3$, $CH_2SO_2R_2$, phenyl, and fluorenylmethyl, which comprises reacting a compound of the formula



wherein $R_2$, $R_3$, and $R_4$, are as defined above, and X is selected from the group consisting of $OSO_2R_2$, Cl, Br, and I, with triphenylphosphine/carbon tetrahalide, concentrating the reaction mixture in vacuo to a concentrate and applying said concentrate to a thick-layer silica gel plate to give the desired compound.

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**4,423,230**

**PREPARATION OF AN INTERMEDIATE FOR N-(METHYLSULFONYL)-1,2,8,8A-CYCLOPROPA[c]BENZO[1,2-b:4,3-b]DIPYRROL-4(5H)-ONE**

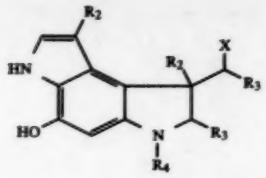
**Wendell Wierenga, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 207,838, Nov. 18, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 346,459**

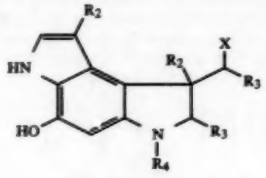
**Int. Cl.³ C07D *487/04***

**U.S. Cl. 548—433** **1 Claim**

1. A process for preparing a compound of the formula



wherein $R_2$ and $R_3$ are H, alkyl of from 1 to 5 carbon atoms, inclusive, and phenyl; $R_4$ is selected from the group consisting of $SO_2R_2$, $SO_2CH_2CO$ phenyl, $CO_2CH_2Z$ where Z is selected from the group consisting of $CH_2I$, $CCl_3$, $CH_2SO_2R_2$, Ph(phenyl), and fluorenylmethyl,
and X is selected from the group consisting of $OSO_2R_2$, Cl, Br, and I, which comprises reacting a compound of the formula



wherein $R_2$, $R_3$, and $R_4$ are as defined above, with a reagent selected from the group consisting of sulfonyl chloride, carbon tetrachloride/triphenylphosphine, carbon tetrabromide/triphenylphosphine, and N-iodosuccinimide triphenylphosphine, separating the organic phase from the reaction mixture, drying and concentrating said organic phase, and recovering the desired product by silica gel chromatography.

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**4,423,231**

## TRICYCLIC IMIDYL DERIVATIVES

**Hans Zweifel, Basel; Walter Schilling, Himmelried; Angelo Storni, Rheinfelden, and Daniel Bellus, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

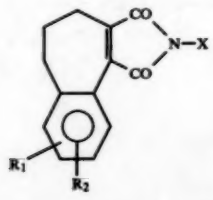
**Division of Ser. No. 183,905, Sep. 4, 1980, Pat. No. 4,337,200, which is a continuation-in-part of Ser. No. 9,985, Feb. 6, 1979, Pat. No. 4,242,264. This application Feb. 16, 1982, Ser. No. 349,119**

**Claims priority, application Switzerland, Feb. 8, 1978, 1400/78**

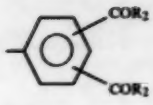
**Int. Cl.³ C07D *209/94***

**U.S. Cl. 548—451** **4 Claims**

1. A compound of the formula



in which R and $R_1$ independently of one another are hydrogen, halogen, alkyl having 1 to 4 carbon atoms or methoxy, and X is a group of the formula



the two —$COR_2$s are bonded to the benzene ring in the meta- or para-position relative to one another and the $R_2$s are each —OH, —Cl, alkoxy having 1 to 4 carbon atoms or phenoxy, or the two —$COR_2$s are bonded to the benzene ring in the ortho-position relative to one another and the two $R_2$s together are —O—.

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**4,423,232**

## TRICYCLIC ISOINDOLE DERIVATIVES

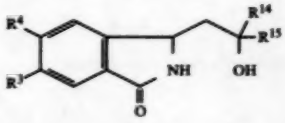
**Christopher A. Demerson, Montreal; Leslie G. Humber, Dollard des Ormeaux, and Jean-Marie Ferland, Laurent, all of Canada, assignors to American Home Products Corporation, New York, N.Y.**

**Division of Ser. No. 78,547, Sep. 24, 1979, Pat. No. 4,273,773. This application Feb. 19, 1981, Ser. No. 235,814**

**Int. Cl.³ C07D *209/46***

**U.S. Cl. 548—472** **2 Claims**

1. A compound of formula XVIII



(XVIII)

in which $R^3$ and $R^4$ each is hydrogen, lower alkoxy, lower alkyl, trifluoromethyl, halo or hydroxy, or $R^3$ and $R^4$ together form a $OCH_2O$ chain; and $R^{14}$ and $R^{15}$ each is hydrogen or lower alkyl.

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**4,423,233**

## HYPOGLYCEMIC 5-SUBSTITUTED OXAZOLIDINE-2,4-DIONES

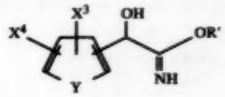
**Rodney C. Schnur, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.**

**Division of Ser. No. 252,961, Apr. 23, 1981, Pat. No. 4,332,952, which is a continuation-in-part of Ser. No. 173,206, Jul. 28, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,777**

**Int. Cl.³ C07D *333/00*; A61K *31/44***

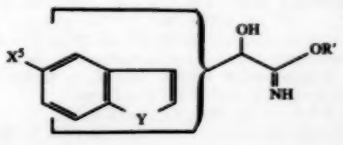
**U.S. Cl. 549—58** **16 Claims**

1. A compound of the formula



(III)

or



(IV)

wherein
R′ is lower alkyl;
Y is sulfur or oxygen;

$X^3$ is hydrogen, fluoro, chloro, bromo, iodo, methyl, phenyl or ($C_1$–$C_3$)-alkoxy;
$X^4$ is hydrogen or methyl; and
$X^5$ is hydrogen, fluoro, chloro, bromo or iodo;
or an acid addition salt thereof.

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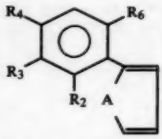
**4,423,234**

## COPPER-CATALYZED BIAROMATIC COUPLING PROCESS

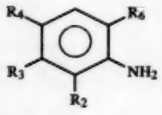
**Ernest L. Plummer, North Tonawanda, and David E. Seelye, Lockport, both of N.Y., assignors to FMC Corporation, Philadelphia, Pa.**

**Filed May 17, 1982, Ser. No. 378,539**
**Int. Cl.³ C07C *2/00***
**U.S. Cl. 549—80** **10 Claims**

1. In a process for preparing a biaromatic compound of the formula



by treating an aniline derivative of the formula



with a lower alkyl nitrite in a solvent of the formula

wherein $R_2$ is hydrogen, halogen, or lower alkyl, $R_3$ is hydrogen (unless $R_2$ is lower alkyl) or halogen, $R_4$ and $R_6$ are independently hydrogen or halogen, and A is —CH=CH—, —NH—, —CH=N—, O, or S, the improvement which comprises adding copper metal to the reaction mixture, thereby increasing the yield of the desired biaromatic compound.

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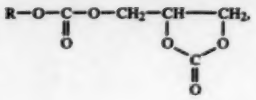
**4,423,235**

## CARBONATES CARRYING CYCLIC CARBONATE GROUPS

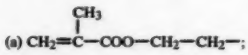
**Michel Burgard, Strasbourg; Marc D. Piteau, Itteville; Alain J. Rollat, Strasbourg Neudorf, and Jean-Pierre G. Senet, La Chapelle la Reine, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France**

**Filed Apr. 14, 1980, Ser. No. 139,155**
**Claims priority, application France, Apr. 13, 1979, 79 09402**
**Int. Cl.³ C07D *317/36***
**U.S. Cl. 549—229** **9 Claims**

1. A carbonate carrying cyclic carbonate groups, of the general formula:

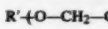


in which R is



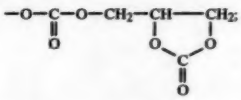
(a) $CH_2=C(CH_3)-COO-CH_2-CH_2-$;

(b) a polyoxyethylene of formula

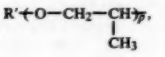


in which n is between 1 and 40 and in which R′ is a hydrocarbon group of 1 to 10 carbon atoms;

(c) a polyoxyethylene of formula $R'(OCH_2CH_2)_n$ in which R′ is a hydrocarbon group of 1 to 10 carbon atoms, n is between 1 and 40 and R′ carries one or two chains $(O—CH_2—CH_2)_{n'}$, in which n′ is between 1 and 40, which chains are terminated by a group

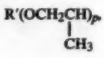


(d) a polyoxypropylene of the formula

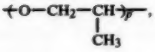


in which p is between 1 and 40 and in which R′ is a hydrocarbon group of 1 to 10 carbon atoms;

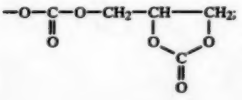
(e) a polyoxypropylene of formula



in which p is between 1 and 40, R′ is a hydrocarbon group of 1 to 10 carbon atoms which carries one or two chains

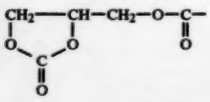


in which p′ is between 1 and 40, which chains are terminated by a group



(f) phenyl;

(g) an aliphatic polycarbonate



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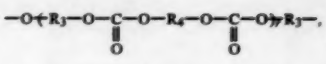
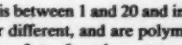


in which r is between 1 and 20 and in which $R_3$ and $R_4$ are identical or different, and are polymethylene groups containing from 2 to 8 carbon atoms or polyoxyethylene groups



in which t is equal to 1, 2, 3, 4 or 5,

(h) an alkyl of 1 to 8 carbon atoms.

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**4,423,236**

**5,6,-0-ISOALKYLIDENE ASCORBIC ACID DERIVATIVES**

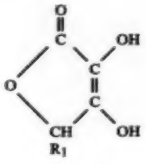
**Andrew J. Welebir, Falls Church, Va., assignor to National Foundation for Cancer Research, Inc., Bethesda, Md.**

**Continuation-in-part of Ser. No. 177,940, Aug. 14, 1980, abandoned. This application Oct. 23, 1981, Ser. No. 314,423**

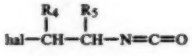
**Int. Cl.³ C07D** *407/00, 307/62*

**U.S. Cl. 549—320** **5 Claims**

**1.** A chemical composition comprising the addition products obtained through the reaction of an enediol ketolactone of the formula:



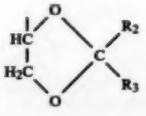
with a 2-haloethyl isocyanate of the formula:



wherein:

hal is selected from the group consisting of I, Br and Cl;

$R_1$ is selected from the group consisting of hydrogen, alkyl, lower alkyl ether, lower alkyl ester, carbonate ester, carboxylic acid or amide, and a ketal or acetal of the formula:



wherein:

$R_2$, $R_3$, $R_4$ and $R_5$ are selected from the group consisting of lower alkyl containing 1 to 3 carbons and H and may be the same or different.

**4.** A composition according to claim **1**, wherein said reaction which forms said addition products is carried out in a dipolar aprotic solvent.

**4,423,237**

**BENZODIOXANE HERBICIDES**

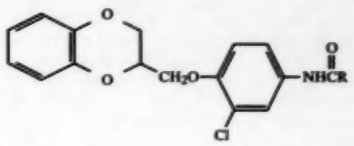
**Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.**

**Continuation of Ser. No. 114,867, Jan. 24, 1980, abandoned, which is a continuation of Ser. No. 938,590, Aug. 31, 1978, abandoned. This application May 24, 1982, Ser. No. 381,136**

**Int. Cl.³ C07D** *319/14;* **A01N** *43/00*

**U.S. Cl. 549—362** **11 Claims**

**1.** A compound having the formula



wherein R is selected from the group consisting of alkoxy having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, alkyl having from 1 to 6 carbon atoms, thioalkyl having from 1 to 6 carbon atoms, chloroalkyl having from 1 to 6 carbon atoms, and alkynyl having from 2 to 6 carbon atoms.

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**4,423,238**

**PROCESS FOR PURIFYING ACETALS**

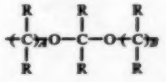
**Jeff T. Fenton, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.**

**Filed Jun. 17, 1982, Ser. No. 378,660**

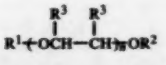
**Int. Cl.³ C07D** *323/06, 321/06, 323/00, 319/06, 317/12, 41/58*

**U.S. Cl. 549—368** **7 Claims**

**1.** A method for removing impurities from trioxane and acetals having the general formula



wherein each R is, independently, hydrogen, alkyl groups containing from 1 to 20 carbon atoms and cycloaliphatic or aromatic groups containing from 6 to 20 carbon atoms and A and B are numbers from 1 to about 3, comprising contacting said trioxane or acetal with an alkali metal in the presence of a phase transfer catalyst, refluxing for a time sufficient to purify the acetal, and separating alkali metals and phase transfer catalysts, wherein the phase transfer catalyst is at least one material selected from the group consisting of cryptates, crown ethers, sulfur or nitrogen analogues of crown ethers, and polyethers having the general formula



wherein $R^1$, $R^2$, and $R^3$ are, independently, hydrogen or alkyl radicals containing from 1 to 20 carbon atoms, and $n \geq 1$.

4,423,239

## METHOD FOR PURIFYING AN EPOXIDATION PRODUCT

Kazuo Miyazaki, Yokohama; Hajime Hara, Fujisawa; Kojiro Teramoto, Kamakura; Hideo Horii, Tokyo; Humiaki Oshimi, Yokohama, and Yoshihiko Araki, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 426,061
Claims priority, application Japan, Oct. 21, 1981, 56-167058
Int. Cl.³ C07D 301/32
U.S. Cl. 549—541 3 Claims

1. In a method for purifying a crude epoxidation product of a liquid conjugated diolefin polymer or a vegetable oil which comprises the steps of adding an aqueous washing agent to a crude epoxidation product which is obtained by the reaction of a liquid conjugated diolefin polymer or a vegetable oil with an organic peracid or an epoxidizing agent capable of generating an organic peracid in situ, stirring the mixture, leaving the mixture to stand to induce phase separation and thereafter withdrawing the organic layer, the improvement wherein 50 to 300 parts by weight, per 100 parts by weight of the crude epoxidation product, of a 10–80% by weight aqueous solution of isopropanol is used as the washing agent.

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4,423,240

## METHODS FOR PREPARING CYCLOPOLYSILOXANE

Yaw D. Yeboah, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 12, 1982, Ser. No. 367,704
Int. Cl.³ C07F 7/04, 7/08
U.S. Cl. 556—460 5 Claims

1. In a process for preparing cyclic dimethylsiloxanes of the formula:

$([CH_3]_2SiO)_m$

where m predominantly equals a whole number 3–6, by hydrolysis and condensation of dimethyldichlorosilane, the improvement which comprises conducting the reaction in the presence of an effective amount of sodium lauryl sulfate.

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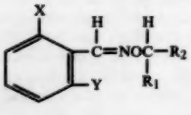
4,423,241

## HERBICIDAL COMPOSITION

Paul J. Caruso, Philadelphia, Pa., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 192,703, Oct. 1, 1980, abandoned. This application Apr. 9, 1982, Ser. No. 367,017
Int. Cl.³ C07C 101/00
U.S. Cl. 560—35 12 Claims

1. A process for the selective control of undesirable vegetation which comprises applying to the locus to be treated a herbicidally effective amount of a compound of the formula:



where X and Y are halogen; $R_1$ is hydrogen or $C_1$ to C7 alkyl; and, $R_2$ is selected from the group consisting of a carboxyl group, a metal salt of a carboxyl group, a $C_1$ to $C_{12}$ ester of a carboxyl group, a $C_1$ to $C_4$ alkylamine salt of a carboxyl group, an amide of a carboxyl group, a hydrazid of a carboxyl group, and cyano group.

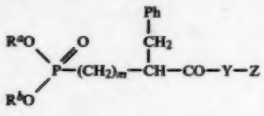
4,423,242

## PHARMACEUTICAL AMIDES, AND PREPARATION, FORMULATIONS AND USE OF THEREOF

Samuel Wilkinson, Beckenham; George W. Hardy, Biggin Hill, and Roger Wrigglesworth, Sevenoaks, all of England, assignors to The Wellcome Foundation Ltd., London, England

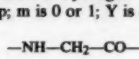
Filed Sep. 24, 1982, Ser. No. 422,995
Claims priority, application United Kingdom, Sep. 25, 1981, 8129055
Int. Cl.³ C07F 9/38; C07C 69/612; A61K 31/66, 31/215
U.S. Cl. 560—41 19 Claims

1. Compounds of the general formula

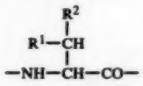


(I)

wherein Ph is a phenyl group which is optionally substituted by one or more substituents selected from halo (i.e. fluoro, chloro, bromo or iodo), $C_{1-4}$alkyl, amino, $C_{1-4}$alkylamino, di-$C_{1-4}$alkylamino, nitro, sulphonyl, aminosulphonyl, trihalomethyl, carboxy, $C_{1-4}$alkoxycarbonyl, amido, $C_{1-4}$alkylamido, $C_{1-4}$alkoxy, $C_{2-4}$alkenyl, cyano, aminomethyl or methylsulphonyl; $R^a$ and $R^b$, which may be the same or different, each represents a hydrogen or alkali metal atom or a $C_{1-4}$alkyl group; m is 0 or 1; Y is a group of formula:



or a group of formula:



where

$R^1$ is hydrogen or methyl;

$R^2$ is alkyl of 1 to 3 carbon atoms or is methylthiomethyl; and

Z is $—OR^3$ or $—NR^4R^5$ where $R^3$, $R^4$ and $R^5$ are each hydrogen or alkyl of 1 to 4 carbon atoms (ie. methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, or t-butyl) and $R^3$ can further be phenylalkyl having 1 to 3 carbon atoms in the alkylene moiety thereof, or phenyl; and basic salts thereof.

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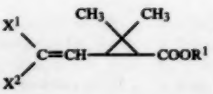
4,423,243

## PROCESS FOR THE PREPARATION OF 2,2-DIMETHYL-3-VINYL-CYCLOPROPANECARBOXYLIC ACIDS AND ESTERS

Manfred Jautelat, Burscheid, and Dieter Arlt, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 16, 1981, Ser. No. 331,403
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1981, 3100354
Int. Cl.³ C07C 69/743
U.S. Cl. 560—124 7 Claims

1. A process for the production of 2,2-dimethyl-3-vinyl-cyclopropanecarboxylic acid derivative of the formula



in which

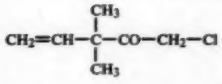
$R^1$ is a hydrogen atom, an alkyl group or a radical of an alcohol selected from the group consisting of 5-benzyl-3-hydroxymethyl-furan, 5-benzyl-2-hydroxymethyl-furan, 5-benzyl-3-hydroxymethyl-thiophene, 5-phenoxy-5-hydroxymethyl-furan, 3-hydroxy-4-methyl-5-allyl-cyclopent-4-en-1-one, N-hydroxymethyl-phthalimide, N-hydroxymethyl-3,4,5,6-tetrahydrophthalimide, pentafluorobenzyl alcohol, 4-phenyl-3-chloro-2-buten-1ol, 3-trifluoromethoxybenzyl alcohol, 3-dichlorovinyloxybenzyl alcohol, 3-propargyloxybenzyl alcohol, 3-dichlorovinyloxy-α-cyano-benzyl alcohol, 3-phenoxybenzyl alcohol, 3-phenyloxy-α-cyano-benzyl alcohol, 3-phenoxy-α-methoxycarbonyl-benzyl alcohol, 3-phenoxy-α-ethinyl-benzyl alcohol, 3-phenoxy-4-fluoro-benzyl alcohol, 3-(4'-fluorophenoxy)-benzyl alcohol, 3-(4'-chlorophenoxy)-benzyl alcohol and 3-(4'-bromophenoxy)-benzyl alcohol, and

$X^1$ and $X^2$ each independently is a halogen atom

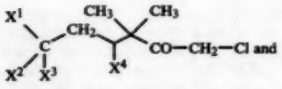
or a fluorine-substituted alkyl radical, comprising adding (a) a polyhalogeno alkane of the formula

in which

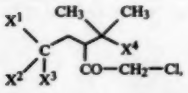
$X^3$ and $X^4$ each independently is a halogen atom, to 1-chloro-3,3-dimethyl-pent-4-en-2-one of the formula



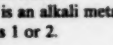
in the presence of a catalyst which yields free radicals, or in the presence of a metal salt of the VIII main group or of the sub-group IVa, VIIa or Ib of the periodic system, thereby to obtain a mixture of compounds of the formula



and



(b) reacting either or both of such compounds with a base of the formula



in which

M is an alkali metal or alkaline earth metal, and

n is 1 or 2.

**4,423,244**

## PROCESS FOR THE PREPARATION OF THE D-2-(6-METHOXY-2-NAPHTHYL)-PROPIONIC ACID

**Vincenzo Cannata, Borgo Nuovo di Pontecchio Marconi, and Giancarlo Tanferlani, Pontecchio Marconi, both of Italy, assignors to Alfa Chemicals Italiana S.p.A., Milan, Italy**

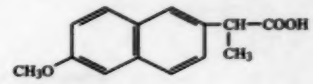
**Filed Mar. 29, 1982, Ser. No. 362,679**

**Claims priority, application Italy, Apr. 1, 1981, 3385 A/81**

**Int. Cl.³ C07C 65/105**

**U.S. Cl. 562—466** **14 Claims**

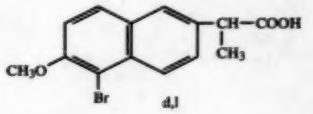
1. A process for preparing the d-2-(6-methoxy-2-naphthyl)-propionic acid of formula I



(I)

d

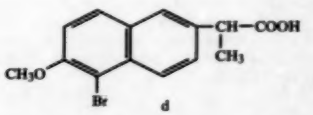
which consists of (1) reacting a mixture of d- and l-2-(5-bromo-6-methoxy-2-naphthyl)-propionic acids of formula II



(II)

d,l

with N-methyl-D-glucamine in a solvent system selected from mixtures of toluene and methanol in various volumetric ratios, in the presence of an optically inactive organic or inorganic base, at a temperature between about room temperature and about 65° C., whereby the N-methyl-D-glucamine salts of the d- and l-isomers of said compound of formula II are formed, letting the less soluble N-methyl-D-glucamine salt of the d-isomer precipitate, separating said salt from the reaction mixture, (2) reacting said salt with a strong mineral acid, whereby the compound d-2-(5-bromo-6-methoxy-2-naphthyl)-propionic acid of formula III



(III)

d

is obtained, and (3) catalytically hydrogenating said compound of formula III in an alkaline medium at a temperature between about room temperature and about 100° C. for a period of time varying from 1 to about 4 hours, whereby the bromine atom in the 5-position is replaced by hydrogen and isolating said compound of formula I from the reaction mixture.

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**4,423,245**

## PROCESS FOR PREPARING 2,5-DICHLORO-3-NITROBENZOIC ACID FROM 2,5-DICHLORO-3-NITRO-P-XYLENE

**Young-Jin Lee, Raleigh, N.C., assignor to Union Carbide Corporation, Danbury, Conn.**

**Filed Jan. 18, 1982, Ser. No. 340,262**

**Int. Cl.³ C07C 51/265**

**U.S. Cl. 562—416** **21 Claims**

1. A process for the preparation of 2,5-dichloro-3-nitrobenzoic acid which comprises reacting 2,5-dichloro-3-nitro-p-xylene in a saturated aliphatic carboxylic acid solvent with oxygen in the presence of a catalyst system, wherein such catalyst system comprises:

(a) a transition metal oxidation catalyst; and

(b) a bromine promoter.

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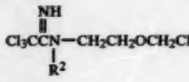
4,423,246

## SELECTED TRICHLOROACETAMIDINES

Lawrence E. Katz, Orange, Conn., assignor to Olin Corporation, New Haven, Conn.

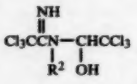
Filed Feb. 22, 1982, Ser. No. 350,912
Int. Cl.³ C07C 123/00, 103/32, 145/02
U.S. Cl. 564—102 3 Claims

1. A compound having the formula:



wherein $R^2$ is selected from the group consisting of $SCCl_3$ and $COCCl_3$.

2. A compound having the formula:



wherein $R^2$ is selected from the group consisting of H, $SCCl_3$ and $COCCl_3$.

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4,423,247

## MANUFACTURE OF ARALKYLARYLAMINES AND ALKYLARYLAMINES

Franz Merger, Frankenthal, Fed. Rep. of Germany, and Ludwig Schroff, deceased, Ludwigshafen, Fed. Rep. of Germany (by Meinie Thea Schroff, heiress), assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 781,148, Mar. 25, 1977, abandoned.
This application Sep. 21, 1978, Ser. No. 944,292
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1976, 2618033
Int. Cl.³ C07C 87/28
U.S. Cl. 564—391 10 Claims

1. A process for the manufacture of aralkylarylamines and alkylarylamines which comprises:

reacting at a temperature above 150° C. in the absence of catalytic amounts of Lewis acid a primary or secondary amine of the formula

I

with a carbonate of the formula

II

where $R^1$ is naphthyl, naphthylene, phenyl or phenylene and the individual radicals $R^2$ and $R^3$ are identical or different and each is aralkyl of 7 to 12 carbon atoms or alkyl of 1 to 7 carbon atoms, said radicals $R^2$ and $R^3$ being unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, carbalkoxy each of 2 to 4 carbon atoms, cyano, halogen or nitro, $R^2$ may also be hydrogen and n is 0 or 1, to form an aralkylarylamine or alkylarylamine of the formula

III

where $R^1$ and $R^3$ are defined as above, $R^4$ has the meanings of $R^2$ or $R^3$ and n is 0 or 1.

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4,423,248

## PROCESS FOR ZONE REFINING WITH A HELICAL SOLUTION ZONE

Philip J. Rennolds, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Dec. 3, 1981, Ser. No. 327,059
Int. Cl.³ C07C 45/79
U.S. Cl. 568—324 6 Claims

1. A method for refining a solid ingot of impure material contained in the annular sample space of zone refiner comprising:

(i) forming a continuous helical liquid solution zone from one end of the ingot to be purified to the other by heating the impure material at a temperature below its melting point along a helical path, said solution zone comprising solvent and the material to be purified,

(ii) rotating the solution zone through the annular sample space thereby separating the pure material from the impurity, the method further characterized in that (a) the pure material and the impurity are soluble in the solvent but to a different extend and (b) there is no displacement of the ingot from one end of the zone refiner to the other end.

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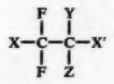
4,423,249

## PREPARATION OF HALOFLUOROALKYL ETHERS

William P. Carl, Angleton, and Bobby R. Ezzell, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

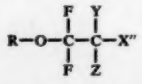
Filed Aug. 26, 1981, Ser. No. 296,607
Int. Cl.³ C07C 41/16
U.S. Cl. 568—655 11 Claims

1. A process comprising contacting in an aprotic solvent a metal hydrocarboxide with a halofluoroalkyl compound represented by formula I



I

wherein X is selected from the group consisting of Cl, Br and I; X′ is selected from the group consisting of Br and I; and Y and Z are independently selected from the group consisting of F, Cl, Br, I and R′, wherein R′ is selected from the group consisting aryl, alkyl including cycloalkyl, or substituted alkyl with the proviso that R′ does not interfere with the reaction between the metal hydrocarboxide and the compound of formula I; under conditions sufficient to form an ether represented by formula II



II

wherein Y and Z are as previously described; X″ is selected form the group consisting of Br, I and H; and R is aryl or alkyl with the proviso that the carbon of said alkyl which is bonded to the oxygen atom shown in formula II must not have any fluorine substituent.

4,423,250

## PROCESS FOR THE PRODUCTION OF OXYGEN-CONTAINING ORGANIC PRODUCTS

Giuseppe Fachinetti, Fauglia, Italy, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 12, 1981, Ser. No. 273,055
Int. Cl.³ C07C 41/00, 41/12, 43/00
U.S. Cl. 568—678 13 Claims

1. The process for the production of oxygen-containing organic products which comprises reacting, in a homogeneous liquid phase, carbon monoxide and hydrogen in the presence of an effective amount of a cobalt-containing compound to form said oxygen-containing organic products said cobalt-containing compounds having the formula:

$$Co_3(CO)_9C—Y$$

wherein Y is selected from the group consisting of hydrogen, deuterium, hydroxy, and alkoxy at an effective temperature and pressure such that the oxygen containing organic product formed contains the substituent Y and at least 2 carbon atoms and 1 oxygen atom more than are present in Y.

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4,423,251

## PROCESS EMPLOYING SEQUENTIAL ISOBUTYLENE HYDRATION AND ETHERIFICATION

Peter R. Pujado, Palatine, and Bipin V. Vora, Elk Grove Village, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Sep. 9, 1982, Ser. No. 416,414
Int. Cl.³ C07C 41/06, 29/04
U.S. Cl. 568—697 15 Claims

1. A hydrocarbon conversion process which comprises the steps of:

(a) dividing a feed stream comprising isobutylene and isobutane into a first portion and a second portion;

(b) passing the first portion of the feed stream into a hydration zone wherein isobutylene is converted into tertiary butyl alcohol and producing a first product stream comprising tertiary butyl alcohol and a first effluent stream comprising isobutylene and isobutane; and,

(c) passing the first effluent stream and the second portion of the feed stream into an etherification zone wherein isobutylene is converted into an ether by reaction with an alcohol and producing a second product stream comprising the ether and a second effluent stream comprising isobutane.

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4,423,252

## PROCESS FOR PREPARING BISPHENOLS

Takao Maki, Fujisawa; Tetsuo Masuyama, Machida; Toshiharu Yokoyama, and Yoshiko Fujiyama, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jul. 2, 1981, Ser. No. 279,692
Claims priority, application Japan, Aug. 7, 1980, 55-108595; Aug. 12, 1980, 55-110785
Int. Cl.³ C07C 39/16
U.S. Cl. 568—728 5 Claims

1. A process for preparing bisphenols, comprising subjecting a phenol and a ketone to condensation in the presence of a sulfonic acid type cation exchange resin partially modified with a pyridinealkanethiol of the formula:

$$Py—(CH_2)_nSH$$

wherein n is a positive integer and Py is 3-pyridyl when n is 1, or 2-, 3- or 4-pyridyl when n is more than 1, at a temperature of 30° to 120° and at atmospheric pressure or a slight positive pressure, said phenol being selected from the group consisting of phenol, o-cresol, m-cresol, o-chlorophenol, m-chlorophenol, o-t-butylphenol, 2,6-xylenol, 2,6-di-t-butylphenol and o-phenylphenol, said ketone being selected from the group consisting of acetone, ethyl methyl ketone, isobutyl methyl ketone, acetophenone, cyclohexanone and 1,3-dichloroacetone.

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4,423,253

## PROCESS FOR SEPARATING T-BUTYLATED PHENOLS

Gerd Leston, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Apr. 26, 1982, Ser. No. 372,056
Int. Cl.³ C07C 37/68
U.S. Cl. 568—756 24 Claims

1. A process for resolving a mixture of two or more phenolics at least one of which is a t-butylated phenolic, comprising the steps of:

treating a mixture of two or more closely-boiling phenolics at least one of which is a t-butylated phenolic, said mixture having a temperature in a range from about 0° C. to about 150° C., with a metal halide salt selected from the group consisting of calcium bromide, calcium chloride, lithium bromide, magnesium chloride and magnesium bromide so as to form preferentially a complex comprised of the selected metal halide salt and one of the phenolics,

whereby the preferentially-formed metal halide salt-phenolic complex may be isolated and thereafter decomposed to a product comprising a predominantly greater amount of one phenolic over other phenolics present, as compared to the relative amounts of phenolics present in the original mixture of phenolics.

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4,423,254

## SUPERACID CATALYZED PREPARATION OF RESORCINOL FROM META-ISOPROPYLPHENOL

George A. Olah, Beverly Hills, Calif., assignor to PCUK Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation-in-part of Ser. No. 211,772, Dec. 1, 1980, abandoned, which is a division of Ser. No. 130,402, Mar. 14, 1980, Pat. No. 4,339,614. This application Jun. 1, 1982, Ser. No. 383,941
Int. Cl.³ C07C 39/06, 37/14
U.S. Cl. 568—781 5 Claims

1. A process of preparing substantially pure meta-isopropylphenol which comprises propylating phenol with:

(a) propylene,
(b) an isopropyl halide,
(c) an isopropyl alcohol,
(d) di isopropylbenzene,
(e) tri isopropylbenzene,
(f) di isopropylphenol, or
(g) tri isopropylphenol,

in the presence of a combination catalyst of:

(1) an excess of anhydrous hydrogen fluoride and a Lewis acid fluoride, or

(2) an excess of anhydrous hydrogen fluoride and a perfluorinated alkanesulfonic superacid of one to eighteen carbon atoms,

at a temperature sufficient to produce substantially pure meta-isopropylphenol.

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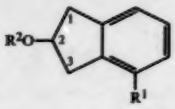
4,423,255

## (+)-4-SUBSTITUTED-2-INDANOLS

John F. Engel, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 221,656, Dec. 31, 1980, and a continuation-in-part of Ser. No. 42,372, May 24, 1979, which is a continuation of Ser. No. 927,198, Jul. 24, 1978, and Ser. No. 870,973, Jan. 20, 1978. This application May 17, 1982, Ser. No. 379,390
Int. Cl.³ C07C 35/32
U.S. Cl. 568—808 3 Claims

1. A 4-substituted-2-indanyl compound of the formula



wherein $R^1$ is phenyl which may be substituted with halogen or lower alkyl, $R^2$ is hydrogen, and the isomer of S configuration at C-2 of the indanyl ring is present in an enantiomeric excess of at least 25% over the isomer of R configuration at C-2 of the indanyl ring.

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**4,423,256**

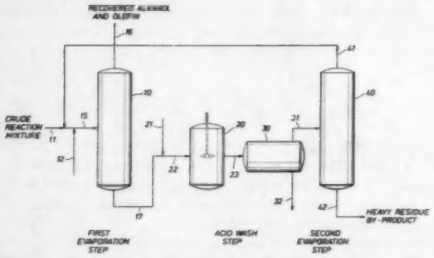
**RECOVERY OF SECONDARY ALKANOLS**

**Paul V. Shaw; Larry W. Payne, both of Houston, Tex.; Charles E. Sanborn, Walnut Creek, Calif., and Eugene F. Lutz, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.**

**Filed Oct. 20, 1982, Ser. No. 435,429**

**Int. Cl.³ C07C *29/06***

**U.S. Cl. 568—886** **10 Claims**




1. In the process for the preparation of a $C_6$ to $C_{20}$ alkanol which comprises sulfating a $C_6$ to $C_{20}$ olefin starting material, hydrolyzing resulting alkylsulfuric acids to obtain a crude alkanol reaction mixture containing $C_6$ to $C_{20}$ alkanol together with $C_6$ to $C_{20}$ olefin starting material and heavy by-product, and separating the crude alkanol reaction mixture into alkanol and olefin rich vapor and heavy by-product rich liquid, the improvement in separation of alkanol and olefin from the crude alkanol reaction mixture which comprises:

(a) in a first evaporation step, evaporating the crude reaction mixture under alkaline pH, withdrawing an alkanol and olefin rich first evaporation overhead vapor containing between about 80 and 98 percent by weight of the alkanol present in the crude reaction mixture and withdrawing a first evaporation bottoms liquid,

(b) in an acid wash step, contacting the first evaporation bottoms liquid with an aqueous acid contact solution, withdrawing a washed organic contact phase, and withdrawing an aqueous contact effluent phase, with the provision that the acid content of the aqueous acid contact solution is sufficient to result in the aqueous contact effluent phase having a pH less than about 1.5, and

(c) in a second evaporation step, evaporating the washed organic contact phase under acidic pH, at a temperature of at least 400° F., withdrawing a heavy by-product rich second evaporation bottoms liquid, with the provision that the average residence time of the second evaporation bottoms liquid at the temperature of the second evaporation is at least about 15 minutes, and withdrawing an alkanol and olefin rich second evaporation overhead vapor, said second evaporation overhead vapor containing a combined quantity by mole of alkanol and olefin greater than that contained in the washed organic contact phase.

**4,423,257**

**PROCESS FOR PRODUCING ETHANOL**

**Nobuo Isogai; Motoyuki Hosokawa; Takashi Okawa; Natsuko Wakui, and Toshiyasu Watanabe, all of Niigata, Japan, assignors to Seiichi Ishizaka, President of Agency of Industrial Science and Technology, Tokyo, Japan**

**Filed Sep. 2, 1982, Ser. No. 414,020**

**Claims priority, application Japan, Sep. 7, 1981, 56-139731**

**Int. Cl.³ C07C *31/08, 29/00***

**U.S. Cl. 568—902** **9 Claims**

1. A process for producing ethanol which comprises reacting methanol, carbon monoxide and hydrogen, characterized in that the reaction is carried out in the presence of (a) at least one solvent selected from the group consisting of hydrocarbons, ethers and mixtures thereof and (b) a catalyst and in the absence of iodine, bromine, an iodine compound or a bromine compound, said catalyst comprising at least one cobalt compound in amount of 1 to 300 milligram atom (mg-atom) in terms of cobalt, at least one ruthenium compound in amount of 0.1 to 100 mg-atom in terms of ruthenium and at least one tertiary phosphine in amount of 2–600 mg-atom in terms of phosphorus per 1 mol of methanol, and atomic ratio of cobalt-:ruthenium:phosphorus in the catalyst being 1:from 0.05 to 0.5:from 0.1 to 2.

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**4,423,258**

**PROCESS FOR PRODUCING ETHANOL**

**Nobuo Ishogai; Motoyuki Hosokawa; Takashi Okawa; Natsuko Wakui, and Toshiyasu Watanabe, all of Niigata, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan**

**Filed Sep. 28, 1982, Ser. No. 426,140**

**Claims priority, application Japan, Feb. 8, 1982, 57-17411**

**Int. Cl.³ C07C *31/08, 29/00***

**U.S. Cl. 568—902** **13 Claims**

1. A process for producing ethanol which comprises reacting methanol, carbon monoxide and hydrogen, characterized in that the reaction is carried out in the presence of (a) at least one inert solvent and (b) a catalyst containing at least one cobalt compound, at least one manganese compound and at least one tertiary phosphine.

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**4,423,259**

**PROCESS FOR PRODUCING PHENYL-[3,3,3-TRIFLUOROPROPYL)PHENYL]METHANE**

**Yoshiro Kobayashi, Tokyo; Itsumaro Kumadaki, Hachiohji; Masaaki Takahashi, Tokyo, and Takashi Yamauchi, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 233,715, Feb. 12, 1981, Pat. No. 4,356,335. This application Feb. 10, 1982, Ser. No. 347,728**

**Claims priority, application Japan, Feb. 22, 1980, 55/21090; Feb. 22, 1980, 55/21091; Feb. 22, 1980, 55/21092; Feb. 22, 1980, 55/21093; Feb. 22, 1980, 55/21094; Sep. 1, 1980, 55/120928; Nov. 21, 1980, 55/164434**

**Int. Cl.³ C07C *17/26***

**U.S. Cl. 570—144** **2 Claims**

1. A process for producing phenyl-[(3,3,3-trifluoropropyl)-phenyl]methane, which comprises bringing (3,3,3-trifluoropropyl)benzene into reaction with benzyl chloride in the presence of an acid catalyst.

4,423,260

## METHOD FOR INTRODUCING FLUORINE INTO AN AROMATIC RING

Karl O. Christe, Calabasas, and Carl J. Schack, Chatsworth, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 27, 1982, Ser. No. 343,033
Int. Cl.³ C07C 17/12
U.S. Cl. 570—147 3 Claims

1. A process for introducing a fluorine atom into the ring structure of an aromatic compound which comprises the step of effecting a substitution reaction between (1) an aromatic compound selected from the group consisting of benzene, toluene and nitrobenzene and (2) a hydrogen fluoride solvent solution of $NF_4BF_4$.

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4,423,261

## PROCESS FOR PRODUCING A GRAPHITE FLUORIDE COMPRISING MAINLY POLYDICARBON MONOFLUORIDE REPRESENTED BY THE FORMULA $(C_2F)_n$

Nobuatsu Watanabe, 136, Uguisudai, Nagaokakyo-shi, Kyoto, Japan; Tsuyoshi Nakajima, Kyoto, and Masayuki Kawaguchi, Arida, both of Japan, assignors to Nobuatsu Watanabe and Applied Science Research Institute, both of Kyoto, Japan

Filed Jan. 8, 1982, Ser. No. 338,108
Claims priority, application Japan, Sep. 10, 1981, 56-143007
Int. Cl.³ C07C 17/00
U.S. Cl. 570—150 6 Claims

1. A process for producing a graphite fluoride comprising mainly poly-dicarbon monofluoride which comprises contacting a graphite material having Franklin's P-value of 0 to 0.4 with fluorine at a temperature in the range of room temperature to about 100° C. in the presence of a fluoride of at least one element selected from the group consisting of alkali metals, alkaline earth metals, elements belonging to Groups I(b), II(b) and III of the periodic table, and elements of the first period of the transition elements; and then heating the resulting reaction system to a temperature in the range of about 300° C. to 500° C., at which temperature the reaction system is maintained until a constant weight of the resulting reaction product is attained.

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4,423,262

## PREPARATION OF DIBROMOSTYRENE

Philip F. Jackisch, Royal Oak, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 13, 1980, Ser. No. 130,119
Int. Cl.³ C07C 17/34
U.S. Cl. 570—193 7 Claims

1. A process for the preparation of an ar-dibromostyrene, said process comprising heating a 2-bromoethyl dibromobenzene at a temperature sufficient to remove HBr from said dibromobenzene and form said ar-dibromostyrene; said process being conducted in the presence of an alkaline mixture of
(i) a promoter quantity of aqueous t-alkoxide ion, and
(ii) a catalytic quantity of a phase transfer catalyst.

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4,423,263

## PROCESS FOR THE SIDE-CHAIN POLYHALOGENATION OF POLYALKYLAROMATIC HYDROCARBONS

Francesco Minisci, Milan; Giancarlo Serboli, Saronno, and Edoardo Platone, San Donato Milanese, all of Italy, assignors to ANIC, S.p.A., Palermo, Italy

Continuation of Ser. No. 279,260, Jul. 1, 1981, abandoned. This application Jun. 29, 1982, Ser. No. 393,441
Claims priority, application Italy, Jul. 15, 1980, 23440 A/80
Int. Cl.³ C07C 21/24, 17/14
U.S. Cl. 570—197 7 Claims

1. A process for the selective polyhalogenation of an alkylbenzene having at least two alkyl chains so as to place a single halogen atom on each alkyl chain which comprises reacting an alkylbenzene with an N-halogenamine at a temperature of from −20° C. to +40° C. in the presence of a proton donor and of a catalyst constituted of a metal ion which is capable of existing in various oxidation states but which is in a lower oxidation state, the quantity of said catalyst varying from 1 to 50 mol % with respect to the alkyl side chains of the starting alkylbenzene, the molar ratio of said proton donor to said N-halogenamine being between 1.2 and 8.

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4,423,264

## PROCESS FOR THE JOINT PRODUCTION OF HIGHLY PURE 1-BUTENE AND PREMIUM GASOLINE FROM A $C_4$ OLEFINIC CUT

Bernard Juguin, Rueil-Malmaison; Jean Cosyns, Maule, and Jean Miquel, Paris, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

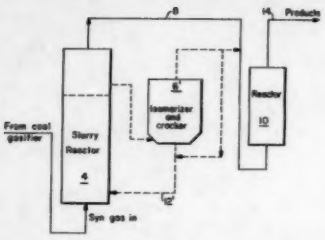
Filed Jun. 25, 1982, Ser. No. 392,056
Claims priority, application France, Jun. 26, 1981, 81 12795; Jul. 2, 1981, 81 13211; Dec. 8, 1981, 81 23065
Int. Cl.³ C07C 2/74
U.S. Cl. 585—255 22 Claims

1. A process for producing highly pure 1-butene and premium gasoline from $C_4$ olefinic cut, characterized in that:
(a) a $C_4$ olefinic cut which, at this stage, contains isobutane, n-butane, 1-butene, 2-butenes, isobutene and butadiene, is subjected to a polymerization-disproportionation during which, on the one hand, the isobutene of said cut is converted at least partly to gasoline and, on the other hand, the so-produced gasoline is subjected at least partly to a reaction of partial disproportionation so as to recover, on the one hand, a cut of the jet fuel base type and, on the other hand, 2-butenes and mainly 1-butene produced by said disproportionation,
(b) the effluent withdrawn from the polymerization-disproportionation zone is subjected to a fractionation giving, on the one hand, a mixture ($\alpha$) of gasoline and jet fuel base and, on the other hand, a fraction ($\beta$) consisting essentially of isobutane, n-butane, 1-butene, 2-butenes, a minor proportion of isobutene and a minor amount of butadiene,
(c) the cut ($\beta$) obtained in step (b) is fed to a selective polymerization zone called finishing polymerization zone, wherein more than 90% of the residual isobutene is converted to gasoline,
(d) the effluent withdrawn from said finishing polymerization zone of step (c) is subjected to a fractionation giving, on the one hand, a cut ($\gamma$) consisting in major part of gasoline containing a mixture of dimers and trimers of isobutene and of 1- and 2-butenes and, on the other hand, a fraction ($\delta$) consisting essentially of isobutane, n-butane, 1-butene, 2-butenes, a minor proportion of isobutene, (less than 0.3% and butadiene traces, less than 100 parts per million),
(e) the cut ($\delta$) issued from step (d) is fed to a selective hydrogenation zone so as to reduce its butadiene content to a maximum of 10 parts per million by weight with respect to the 1-butene of said cut,
(f) the effluent from the selective hydrogenation step (e) is supplied to a deisobutanization zone is order to remove the major part of the isobutane contained therein,
(g) the so-deisobutanized fraction is subjected to a fractionation giving on the one hand, a cut containing a major portion of 2-butenes and n-butane and, on the other hand, a fraction containing at least 99% by weight of 1-butene, and the mixture ($\alpha$) formed by the gasoline and the jet fuel base obtained in step (b) is admixed with the gasoline cut ($\gamma$) obtained in step (d).

## 4,423,265
## PROCESS FOR SNYGAS CONVERSIONS TO LIQUID HYDROCARBON PRODUCTS

**Yung-Feng Chu, Cherry Hill; Tai-Sheng Chou, Sewell, and Arthur W. Chester, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.**

**Filed Dec. 1, 1982, Ser. No. 445,810**
**Int. Cl.³ C07C *1/04, 1/06***
**U.S. Cl. 585—322** **14 Claims**




1. A process for converting synthesis gas to liquid hydrocarbons having a boiling range within that of gasoline and distillate comprising the steps of:

(a) charging said synthesis gas to a Fischer-Tropsch synthess conversion zone comprising a catalyst providing CO reducing characteristics in a single or a combination of catalyst particles in direct contact with a suspending liquid medium;

(b) separating at least a fraction of said suspending liquid medium containing dissolved heavier hydrocarbons from said catalyst particles;

(c) contacting said separated suspending medium containing heavier hydrocarbons with a cracking and isomerization catalyst under conditions effective to crack and isomerize at least a portion of said heavier hydrocarbons to lighter hydrocarbons;

(d) separating the resultant product stream of (c) into two streams;

(e) removing an effluent stream from said conversion zone of (a) to a second reaction zone containing a crystalline zeolite catalyst;

(f) returning one of said streams of (d) to said effluent stream from zone (a);

(g) returning the remaining stream of (d) to said conversion zone of (a); and

(h) contacting said effluent stream from said conversion zone of (a) with a crystalline zeolite catalyst to convert the product of said Fischer-Tropsch synthesis gas conversion to hydrocarbons boiling within the range of distillate and gasoline.

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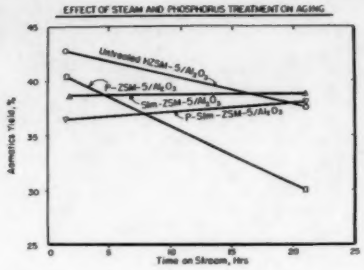
## 4,423,266
## EXTENDING ISOMERIZATION CATALYST LIFE BY TREATING WITH PHOSPHORUS AND/OR STEAM

**Lewis B. Young, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 195,032, Oct. 8, 1980, Pat. No. 4,356,338, which is a division of Ser. No. 61,223, Jul. 27, 1979, abandoned. This application Jul. 30, 1982, Ser. No. 403,756**
**Int. Cl.³ C10G *49/08***
**U.S. Cl. 585—481** **8 Claims**

1. A process for carrying out hydrocarbon isomerization conversion reactions over a catalyst comprising a crystalline zeolite characterized by a silica to alumina molar ratio of at least 12 and a Constraint Index of from about 1 to 12, the improvement which comprises:

pretreating said catalyst to reduce the rate of catalyst aging and detrimental formation of coke thereon which occurs during said conversion reactions, by reacting said catalyst with a phosphorus-containing compound to deposit between about 2% and 15% by weight of phosphorus on said catalyst and by subjecting said catalyst to an atmosphere comprising from about 5% to 100% of steam at a temperature from about 250° C. to about 1000° C. for a period of from about 15 minutes to about 100 hours.

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## 4,423,267
## SUPPORTED FERRIC SULFATE AND COBALT SULFATE CATALYSTS FOR THE OLIGOMERIZATION OF OLEFINS

**Robin M. Dowling, Tonkawa, and David P. Higley, Ponca City, both of Okla., assignors to Conoco Inc., Ponca City, Okla.**

**Filed Jun. 1, 1982, Ser. No. 383,412**
**Int. Cl.³ C07C *2/02***
**U.S. Cl. 585—531** **12 Claims**

1. A process for the oligomerization of olefins which comprises:

contacting lightly branched and/or linear olefins in the range of $C_2$ to $C_{40}$ at temperatures in the range of −10° C. to 400° C., and under pressures between 1 and 75 atmospheres, with a catalyst prepared by combining a ferric sulfate solution of a minimum 0.05 molar strength and alumina or silica-alumina support, permitting the support to adsorb the ferric sulfate for a period between 15 minutes to 24 hours so that the weight percent of iron on the support is between 0.005 to 50%, recovering the solid catalyst, drying and calcining the recovered catalyst for a period of from 1 to 12 hours and at a temperature in the range of 250° C. to 700° C.;

collecting the oligomerized olefinic product.

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## 4,423,268
## LOW PRESSURE OLIGOMERIZATION OF GASEOUS OLEFINS

**Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Jan. 8, 1982, Ser. No. 338,178**
**Int. Cl.³ C07C *2/02***
**U.S. Cl. 585—533** **10 Claims**

1. A process for oligomerizing normally gaseous alkenes, comprising:

(a) contacting under low pressure oligomerization conditions a feed comprising normally gaseous alkenes with a catalyst comprising an essentially alumina free intermediate pore size silicaceous crystalline molecular sieve having a silica:alumina mole ratio greater than about 200:1, selected from silicalite, CZM, or mixtures thereof; and

(b) recovering an effluent comprising oligomers of said alkenes.

4,423,269

## OLIGOMERIZATION OF GASEOUS OLEFINS

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 25, 1981, Ser. No. 305,680
Int. Cl.³ C07C 2/02
U.S. Cl. 585—533 22 Claims

1. A process for oligomerizing alkenes, comprising:

(a) contacting under oligomerization conditions a feed comprising one alkene which is a gas under said oligomerization conditions with a catalyst comprising an intermediate pore size silicaceous crystalline molecular sieve substantially free of hydrogen transfer activity selected from silicalite, an organosilicate disclosed in RE 29,948, CZM or mixtures thereof; and

(b) recovering an effluent comprising oligomerized alkene wherein at least some of said oligomerized alkenes are liquid under said oligomerization conditions.

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4,423,270

## PROCESS FOR CATALYTIC DEHYDRATION OF ETHANOL VAPOR TO ETHYLENE

Donald E. Pearson, 112 Clydelan Ct., Nashville, Tenn. 37205

Continuation-in-part of Ser. No. 306,087, Sep. 28, 1981, abandoned. This application Dec. 20, 1982, Ser. No. 451,482
Int. Cl.³ C07C 1/00
U.S. Cl. 585—639 10 Claims

1. In a process for the catalytic dehydration of an aqueous ethanol vapor to ethylene, the process improvement comprising carrying out said reaction in a catalyst bed containing a substituted phosphoric acid catalyst, said catalyst comprising a granular porous catalyst support compatible with phosphoric acid having absorbed thereon a catalytically effective amount of a substituted phosphoric acid in which at least one of the hydroxyl groups thereof has been replaced by a hydrophobic organic group containing from 4 to 22 carbons.

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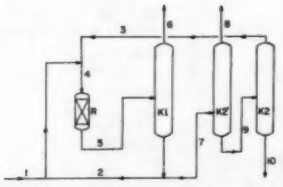
4,423,271

## PROCESS FOR PRODUCING HIGH PURITY ISOBUTENE BY DEHYDRATING TERTIARY BUTANOL

Fritz Obenaus; Bernd Greving, both of Marl; Heinrich Balke, Herten, and Bernhard Scholz, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,576
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151446
Int. Cl.³ C07C 5/22
U.S. Cl. 585—639 5 Claims




1. A process for producing high-purity isobutene by dehydrating tertiary butanol in the presence of an acid catalyst, comprising:

(a) continuously feeding an aqueous solution containing from about 40 to 90 percent by weight of tertiary butanol into a reactor and dehydrating in a homogeneous and liquid phase at a fixed catalyst bed consisting of a strongly acidic ion exchange resin at a temperature from about 80° to 150° C. and a pressure of about 5 to 25 bars;

(b) fractionating the homogeneous, liquid reaction mixture in a distillation part separate from the reaction chamber and separating isobutene from the water and from the unreacted tertiary butanol; and

(c) concentrating the unreacted tertiary butanol by distillation and feeding back a first portion of the mixture of water and unreacted tertiary butanol from step (b) to step (a), and discharging a second portion of said mixture at a rate sufficient to remove excess water.

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4,423,272

## REGENERATION OF METHANOL/METHYL ETHER CONVERSION CATALYSTS

Nancy P. Forbus, Princeton, and Margaret M. Wu, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,797
Int. Cl.³ C07C 1/24, 1/20; B01J 29/38
U.S. Cl. 585—640 6 Claims

1. In a process whereby the organic reactants methanol and/or methyl ether ar catalytically converted in the vapor phase to a hydrocarbon product rich in ethylene and propylene in a reaction zone under conversion conditions including elevated temperature and pressure and in the presence of a catalyst comprising a crystalline aluminosilicate zeolite material characterized by a crystalline structure having pore windows formed by 8-membered rings of oxygen atoms, the improvement which comprises:

effecting regeneration of said catalyst, to restore catalytic activity diminished during conversion of the organic reactants, by contacting said catalyst with hydrogen-containing gas in the reaction zone, in the presence of said vapor phase organic reactants and at a regeneration pressure which exceeds the elevated pressure of the conversion conditions existing in said reaction zone immediately prior to said catalyst regeneration and at a regeneration temperature of from about 200° C. to 600° C. and a regeneration pressure of from about 50 to 700 psig.

2. A process according to claim 1 wherein said regeneration temperature ranges from about 300° C. to 500° C. and said regeneration pressure ranges from about 100 psig to 500 psig.

3. A process according to claim 2 wherein said zeolite material is selected from erionite, offretite, chabazite, Zeolite T, Zeolite W and ZSM-34.

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4,423,273

## PREPARATION OF OLEFINS FROM METHAOL AND/OR DIMETHYL ETHER

Wolfgang Hoelderich; Wolf D. Mross, both of Frankenthal, and Matthias Schwarzmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 22, 1982, Ser. No. 400,698
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1981, 3132024
Int. Cl.³ C07C 1/20
U.S. Cl. 585—640 8 Claims

1. A process for the preparation of olefins by converting methanol and/or dimethyl ether at elevated temperature in the presence of a zeolite catalyst which has been treated by contacting the zeolite with hydrogen fluoride.

## 4,423,274
## METHOD FOR CONVERTING ALCOHOLS TO HYDROCARBONS

**Nicholas Daviduk, Pennington, and James H. Haddad, Princeton Junction, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 193,675, Oct. 3, 1980, Pat. No. 4,338,475, which is a division of Ser. No. 89,705, Oct. 30, 1979, Pat. No. 4,251,484. This application Apr. 15, 1982, Ser. No. 368,549**

**The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.**

**Int. Cl.³ C07C *1/20, 1/24***

**U.S. Cl. 585—640** **9 Claims**

1. A method for converting reactant materials selected from the group consisting of lower alcohols, either derivatives thereof, oxygenates of synthesis gas and any one or a combination thereof, which process comprises:

passing the reactant material in vaporous, liquid or mixed liquid-vapor condition upwardly through a fluid bed of zeolite catalyst particles, said zeolite characterized by a silica/alumina ratio of at least 12, a pore opening of at least 5 Angstroms and a Constraint Index within the range of about 1 to 12, at a temperature constrained within the range of about 530° F. to about 800° F. under pressure and space velocity conditions selected to achieve from about 40% to about 95% conversion of the reactant materials passed to the bed to olefin-enriched hydrocarbon products, said temperature constrained limits achieved at least in part by a plurality of heat exchange tubes immersed in a fluid bed of said catalyst and providing high pressure steam therein as a result of said heat exchange, said reactant material restricted in gasified bubble growth to less than 24 inch equivalent hydraulic diameter during contact with said bed of fluid catalyst particles by said heat exchange tubes or by a plurality of vertical open ended baffle tubes slotted in the wall thereof for flow of catalyst and gasiform reactant material therethrough adjacently positioned in combination with said heat exchange tubes, said reactant conversion exotherm further constrained by maintaining from 5% to 30% by weight of coke-like material on the zeolite catalyst in the reaction zone;

maintaining a high rate of catalyst circulation from a dispersed catalyst phase above said fluid catalyst bed to a bottom portion of said bed following separation of reaction product from said catalyst passing into said dispersed phase; and

recovering olefin-enriched hydrocarbon products of said conversion operation.

## 4,423,275
## OLEFIN CONVERSION

**William H. Myers, Richmond, Va., assignor to Ethyl Corporation, Richmond, Va.**

**Filed Sep. 17, 1982, Ser. No. 419,211**

**Int. Cl.³ C07C *6/00***

**U.S. Cl. 585—645** **16 Claims**

1. A disproportionation process which comprises contacting a suitable olefinic reactant with a catalyst comprising a dicarbonyl(cyclopentadienyl)nitrosyl complex of molybdenum or tungsten and an alkylaluminum halide.

## 4,423,276
## OLEFIN ISOMERIZATION PROCESS

**Thomas H. Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.**

**Filed Nov. 26, 1982, Ser. No. 444,755**

**Int. Cl.³ C07C *5/24, 5/30***

**U.S. Cl. 585—665** **14 Claims**

1. A process for the isomerization of an internal olefin in the carbon number range from 4 to about 30 to an alpha olefin, which comprises steps for:

(a) contacting a compound of the formula $Cp_2TaH_3$, wherein Cp represents an optionally alkyl-substituted cyclopentadienyl, indenyl, or fluorenyl radical, with the internal olefin to form a complex, and

(b) liberating alpha olefin from said complex.

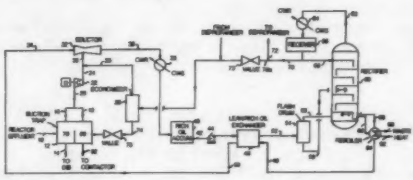
## 4,423,277
## ALKYLATION PROCESS UTILIZING ABSORPTION REFRIGERATION

**William R. Stroud, 10537 Beinhorn, Houston, Tex. 77024**

**Filed Jun. 25, 1982, Ser. No. 392,418**

**Int. Cl.³ C07C *2/56***

**U.S. Cl. 585—719** **44 Claims**



1. A process for catalytic alkylation of isoparaffinic hydrocarbons with at least one olefin, comprising the steps of,

(a) contacting the olefin with a molar excess of an isoparaffinic hydrocarbon in the presence of an acid catalyst in a reactor, the reactor effluent including at least alkylate, acid catalyst, and unreacted isoparaffinic hydrocarbons,

(b) separating substantially all of the acid catalyst from the reactor effluent,

(c) subjecting the reactor effluent less than acid catalyst from step (b) to a separation step resulting in a substantially liquid stream containing alkylate and hydrocarbons and a substantially vaporous stream containing isoparaffinic hydrocarbon,

(d) recovering alkylate product from the substantially liquid stream from step (c),

(e) admixing the substantially vaporous stream from step (c) with an absorbent and condensing the mixture to substantially a liquid,

(f) heating and rectifying the condensed liquid from step (e) whereby an isoparaffinic hydrocarbon stream is separated as distillate from the absorbent, and

(g) condensing the isoparaffinic hydrocarbon stream from step (f) and returning at least a portion of it ultimately to step (a), and returning the absorbent from step (f) to step (e).

## 4,423,278
## REMOVING COLOR FROM POLYPHENYLATED ALKANE

**Kang Yang; James D. Reedy; S. E. McGuire, and O. C. Kerfoot, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.**

**Filed Jan. 17, 1983, Ser. No. 436,214**

**Int. Cl.³ C07C *7/13***

**U.S. Cl. 585—823** **11 Claims**

1. A method for the removal of color causing compounds from polyphenylated alkane comprising: contacting colored polyphenyated alkane with a solid adsorbant selected from the group consisting of

(a) bauxite clays containing from about 0.1 to about 20% by weight of at least one material selected from the group consisting of ferric oxide, titanium dioxide, and zirconium oxide, said clay contacted with from about 0.1 to about 20% by weight sulfuric acid, then activated for the removal of color causing compounds by calcining the mixture at a temperature and time sufficient to activate the adsorbant prior to use, and,

(b) crystalline zeolite suspended in a silica alumina matrix

wherein said zeolite is present in the range of from about 5% to about 20% by weight of zeolite based on the total weight of the adsorbants.

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**4,423,279**

## SEPARATION OF BI-ALKYL SUBSTITUTED MONOCYCLIC AROMATIC ISOMERS WITH PYROLYZED ADSORBENT

**Santi Kulprathipanja, Hoffman Estates, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Filed Feb. 25, 1982, Ser. No. 352,395**
**Int. Cl.³ C07C *7/12***
**U.S. Cl. 585—828** **21 Claims**

1. A process for separating a para-isomer from a feed mixture comprising at least two bi-alkyl substituted monocyclic aromatic isomers, including the para-isomer, said isomers having from 8 to about 18 carbon atoms per molecule, which process comprises contacting at adsorption conditions said feed with an adsorbent comprising a zeolite which has been contacted at pyrolyzing conditions comprising a substantially oxygen-free environment at a temperature of from about 200° C. to about 800° C. for a period of contact time comprising from about 2 hours to about 10 hours with a pyrolyzing agent comprising an organic solvent containing from 1 to 5 carbon atoms to effect the adsorption of the para-isomer and thereafter recovering the para-isomer.

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**4,423,280**

## SELECTIVE SORPTION BY ZEOLITES

**Ralph M. Dessau, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 105,190, Dec. 19, 1979, Pat. No. 4,309,281. This application Sep. 30, 1981, Ser. No. 307,050**
**Int. Cl.³ C07C *7/13***
**U.S. Cl. 585—829** **15 Claims**

1. A process for the selective separation of non-aromatic compounds in admixture with aromatic compounds which comprises contacting the mixture with zeolite ZSM-23 or ZSM-35, said zeolites characterized by a silica to alumina mole ratio of greater than about 12 to effect the selective sorption of said non-aromatic compounds by said zeolite.

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**4,423,281**

## PROCESS FOR PRODUCING CONJUGATED DIOLEFINS

**Haruhisa Yamamoto, and Nobuaki Yonezama, both of Takaoka, Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan**

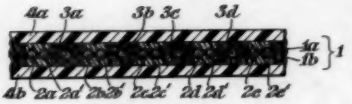
**Filed Mar. 31, 1981, Ser. No. 249,614**
**Claims priority, application Japan, Apr. 4, 1980, 55-44137**
**Int. Cl.³ C07C *5/18, 5/48***
**U.S. Cl. 585—626** **7 Claims**

1. In a process for producing a conjugated diolefin which comprises oxidatively dehydrogenating a monolefin having at least 4 carbon atoms in the vapor phase with molecular oxygen to form the corresponding conjugated diolefin; the improvement wherein the oxidative dehydrogenation is carried out in the presence of a catalyst having the general composition formula

$$Mo_aBi_bCr_cNi_dX_eY_fO_g$$

wherein X represents at least one element selected from Li, Na, K, Rb, Cs, Tl and P, Y represents at least one element selected from Al, Ga, Zr, Pb, Nb, Ta, Hf and Mn, and a, b, c, d, e, f and g respectively represent the number of Mo, Bi, Cr, Ni, X, Y and O atoms, and when a=12, b=0.05–20, c=0.05–20, d=0.1–30, e=0.01–10, f=0.01–20, and g is the number of oxygen atoms which satisfies the atomic valences of the other elements.

4,423,282
## FLAT CABLE
Hirosuke Suzuki, 205-22, Kitanaka, Tokorozawa, Saitama-ken, Japan (359), and Norikazu Ishigoboka, 2175-82, Takahagi, Hidaka-machi Iruma-gun, Saitama-ken, Japan 350-12
Filed Jun. 29, 1981, Ser. No. 278,871
Int. Cl.³ H01B 11/04, 7/08, 11/06
U.S. Cl. 174—36 5 Claims




1. A flat cable comprising a plurality of conductors, arranged in a parallel spaced relationship and embedded in a expanded porous polytetrafluoroethylene insulation the dielectric constant of said porous insulation being variable between adjacent conductors; said embedded conductors contained within said insulation being contained between at least two layers of a substantially nonporous polytetrafluoroethylene insulation having a higher dielectric constant than said porous insulation.

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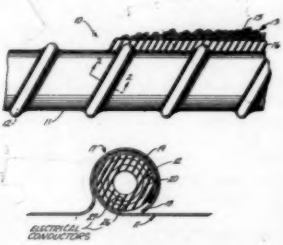
4,423,283
## CONTROLLABLE STIFFNESS DUCT
Victor P. Weismann, 430 Prospect Cir., South Pasadena, Calif. 91030
Filed Jun. 25, 1981, Ser. No. 277,182
Int. Cl.³ F16L 11/11, 11/12, 11/16
U.S. Cl. 174—47 8 Claims




1. A spiral wound strip having a turns interlock continuously along the spiral for defining a flexible duct, and an inflatable seal disposed in the interlock, said seal when inflated stiffening the duct.

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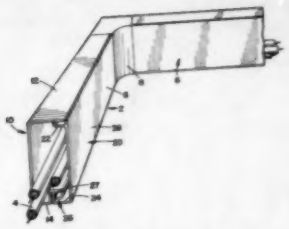
4,423,284
## MOULDING DUCT
Steve E. Kaplan, 155 Overbrook Rd., Elyria, Ohio 44035
Filed Jun. 4, 1982, Ser. No. 384,783
Int. Cl.³ H02G 3/04
U.S. Cl. 174—101 5 Claims

1. A generally rectangular wiring raceway having a back panel with a back portion adapted to be secured to a wall and further having a top leg and a bottom leg extending substantially perpendicularly from said back portion and wherein said top leg terminates in a snap closure member and said bottom leg terminates in a first hinge member, said first hinge member being formed by extending the bottom leg in a predetermined distance from the back portion to a point at which the leg turns upwards toward said top leg in a direction substantially parallel to the back portion, then again perpendicularly outwardly from said back panel in a direction substantially parallel to said bottom leg, then in a curved fashion such that it folds back upon itself, thereby defining a channel open at the bottom for reception of a second hinge member;

a front panel having a top snap portion for engagement with the snap closure member of said top leg of said back panel and a bottom portion defining a second hinge member for reception in the first hinge member of the bottom leg of the back panel, said second hinge member being formed by extending a leg from the bottom of the front panel in a direction substantially perpendicular to said front panel a predetermined distance, said leg then angling upwardly in



a direction substantially parallel to the front panel, said leg having a terminal portion, said second hinge member further having a longitudinally extending bead at its terminal portion, and wherein said bead is adapted for receipt in the first hinge member and wherein the portions of both hinge members running substantially parallel respectively to the back of the back panel and the front panel abut each other when the front panel is opened so as to hold the front panel in a position so that cables contained within the raceway may rest on the front panel when said raceway is opened.

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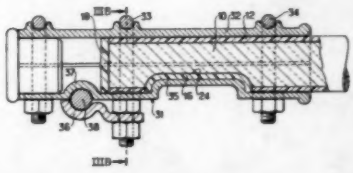
4,423,285
## ELECTRIC INSULATOR, IN PARTICULAR FOR A PHASE SPACER, A COMPENSATING ARM OR A DISTANCE PIECE
Denis Thuillier, Vichy, and Michel Willem, Abrest, both of France, assignors to Societe Anonyme dite: CERAVER, Paris, France
Filed Feb. 9, 1982, Ser. No. 347,290
Claims priority, application France, Feb. 13, 1981, 81 02889
Int. Cl.³ H02G 7/12; H01B 7/16
U.S. Cl. 174—146 5 Claims



1. An electric insulator to be used as a spacer associated with at least one electric cable, said insulator including an elongated glass fiber reinforced insulating rod covered with an insulating sheath and having adjacent to at least one of its ends means for fixing an electric cable to said at least one end, wherein the improvement comprises:

said insulating rod is formed with an indentation spaced from said at least one end and extending transversely to the longitudinal axis of the rod on only one side of the neutral axis of the rod in bending, and

said means for fixing an electric cable to said at least one end comprises first and second rigid half sleeves, the first half sleeve having an internal boss which conforms to said indentation in the rod, and means for holding the first and

second half sleeves against corresponding opposed semi-peripheral portions of the insulator at the at least one end of the rod and for fixing an electric cable against said first half sleeve.

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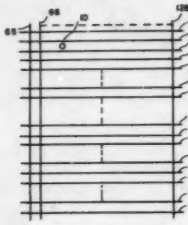
**4,423,286**

## APPARATUS AND METHOD FOR DETERMINING THE POSITION OF A DRIVEN COIL WITHIN A GRID OF SPACED CONDUCTORS

**Gary A. Bergeron, Phoenix, Ariz., assignor to Talos Systems, Inc., Scottsdale, Ariz.**

**Filed Jul. 21, 1982, Ser. No. 400,511**
**Int. Cl.³ G08C *21/00***
**U.S. Cl. 178—19** **20 Claims**



1. Apparatus for determining the position of a transmitting coil with respect to a grid of spaced parallel conductors located adjacent to the transmitting coil, comprising:

means for sampling the signals induced in only a selected small percentage of the conductors so as to successively reduce the possible position of the coil to smaller and smaller areas until the position is determined to be intermediate two of the conductors; and

means responsive to the signals induced in the two conductors to determine the precise position of the coil.

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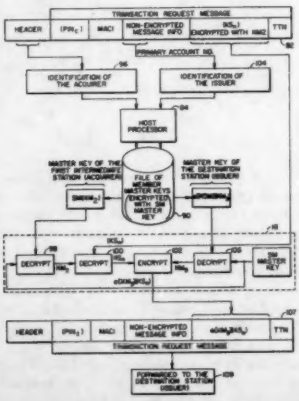
**4,423,287**

## END-TO-END ENCRYPTION SYSTEM AND METHOD OF OPERATION

**Howard M. Zeidler, Palo Alto, Calif., assignor to VISA U.S.A., Inc., San Francisco, Calif.**

**Filed Jun. 26, 1981, Ser. No. 278,001**
**Int. Cl.³ H04L *9/00***
**U.S. Cl. 178—22.08** **12 Claims**



6. A method of operating a network/interchange transaction execution system of the type which includes a plurality of issuer stations, each having a separate data processor which stores account information for a plurality of accounts, a plurality of transaction terminals for input and output processing of user initiated transactions, including network/interchange transactions, a plurality of acquirer stations, each connected to a plurality of separate transaction terminals, and a network switch which communicatively interconnects the acquirer stations with the issuer stations, the method comprising the steps of:

(a) at an acquirer station, batch generating and storing a plurality of session keys, each key being encrypted in a first master key and in a second master key to form session key encryption pairs,

(b) at one of the transaction terminals, receiving the transaction data and a personal identification number. PINc, from a user, encrypting the PINc with a session key, $KS_1$, received by said transaction terminal from said acquirer station during the immediately preceding network/interchange transaction, concatenating the PINc and selected elements of the transaction data and computing a first message authentication code, MAC1, using the concatenated data and the session key, and transmitting a network/interchange request message comprised of the encrypted PIN, the MAC1 and the transaction data, to said acquirer station,

(c) at said acquirer station, receiving the network/interchange request message from said transaction terminal, locating the corresponding session key, $KS_1$, of the encryption pair which is encrypted in the second master key and relaying it along with the message to the network switch,

(d) at the network switch, translating the session key from second master key encryption to encryption in a third master key and relaying it along with the network/interchange request message to a particular issuer as specified by data in the network/interchange request message,

(e) at said issuer, receiving the network/interchange request message, decrypting the encrypted session key, $KS_1$, recomputing and verifying the MAC1 using the decrypted session key, $KS_1$, accessing the data base for the account specified by data in the network/interchange request message, translating the session key encrypted PINc into a data base encrypted PINc and comparing and verifying it with a data base encrypted PIN stored in association with the specified account in the data base, then generating an authorization code, recomputing a second message authentication code MAC2 using the session key, and transmitting a response message, including the authorization code and the MAC2 via the network switch to said acquirer station,

(f) at said acquirer station, receiving the response message with the authorization code and the MAC2, retrieving the first master key encrypted session key $e[KM_1](KS_2)$ of a new session key encryption pair, and relaying the response message, including the authorization code, the MAC2 and $e[KM_1](KS_2)$ to said transaction terminal, and

(g) at said transaction terminal, receiving the response message, including the authorization code, the MAC2 and $e[KM_1](KS_2)$, recomputing and verifying the MAC2 using the previous session key, $KS_1$, acting on the authorization code to carry out the transaction, and replacing the old encrypted session key $e[KM_1](KS_1)$ with the new encrypted session key $e[KM_1](KS_2)$.

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**4,423,288**

## MODULAR TELEPHONE JACK

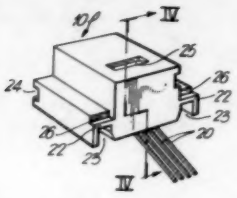
**Gerald F. Webb, Thorndale, Canada, assignor to Northern Telecom Limited, Montreal, Canada**

**Filed Oct. 29, 1979, Ser. No. 89,242**
**Int. Cl.³ H01R *13/40, 13/54***
**U.S. Cl. 339—176 M** **6 Claims**

1. A modular telephone jack having a top part and a bottom

part, in superposed position, said top and bottom parts defining an aperture therebetween for reception of a modular plug;

said top part comprising a main body portion, a lateral extension along each side of the main body portion, a groove extending along the bottom surface of each extension, a recess in the forward end of each extension; a recess in the top surface of each extension adjacent to the rear end thereof, and a recess in the top surface of the main body portion adjacent to the rear end thereof;




said bottom part comprising a wall member having an aperture therein for reception of said top part, two parallel spaced apart walls extending forward normal to the plane of said wall member, an upper edge on each side wall, said edges forming ribs for sliding engagement in said grooves in said lateral extensions; a rearwad facing extension at the front end of each upper edge for engagement in the recesses in the forward ends of the extensions; at least one deformable member extending into said aperture and engageable in one of said recesses.

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**4,423,289**

## SIGNAL PROCESSING SYSTEMS

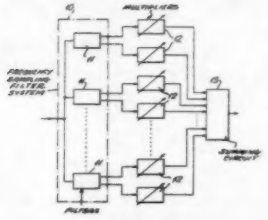
**Malcolm A. Swinbanks, Cambridge, England, assignor to National Research Development Corporation, London, England**

**Filed Jun. 23, 1980, Ser. No. 162,242**

**Claims priority, application United Kingdom, Jun. 28, 1979, 7922572**

**Int. Cl.³ E04B 1/99**

**U.S. Cl. 381—71** **8 Claims**




1. A signal processing system comprising:

means for generating a plurality of signal sets, each of said sets including at least an in-phase component and being generated by performing a filtering operation on a common input signal, each said filtering operation having an amplitude response characteristic which has a peak at one of a series of particular frequencies interrelated by a predetermined function, a substantially zero value at all other particular frequencies of said series and intermediate values at frequencies between the particular frequencies of said series, said one of said series being a different one for each of said filtering operations; and

means, responsive to said signal sets generating means, for generating an output signal related to the sum of said in-phase components and quadrature components related thereto, said output signal generating means including means, responsive to said signal sets for independently varying the magnitude of the contribution made by each of said components to said sum.

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**4,423,290**

## SPEECH SYNTHESIZER WITH CAPABILITY OF DISCONTINUING TO PROVIDE AUDIBLE OUTPUT

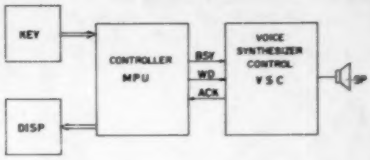
**Hideo Yoshida, Kashihara, and Hiroshi Tsuda, Uji, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Dec. 22, 1980, Ser. No. 218,752**

**Claims priority, application Japan, Dec. 28, 1979, 54-171551**

**Int. Cl.³ G10L 1/00**

**U.S. Cl. 381—51** **8 Claims**




1. A speech synthesizer device comprising:

synthesizing means for providing a sound synthesis waveform signal in response to an input signal applied thereto;

instructing means for providing an interruption instruction when speech synthesis by said synthesizer device is to be interrupted;

means for determining the level of the waveform signal; and

interrupting means responsive to said determining means and operatively connected to said synthesizing means for interrupting said synthesizing means in response to the instruction from said instructing means when the waveform signal is at a relatively low amplitude level.

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**4,423,291**

## METHOD FOR OPERATING A SPEECH RECOGNITION DEVICE

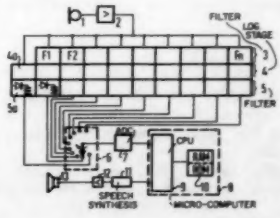
**Eberhard Zwicker, Icking, and Wolfgang Daxer, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Feb. 4, 1981, Ser. No. 231,452**

**Claims priority, application Fed. Rep. of Germany, Mar. 7, 1980, 3008830**

**Int. Cl.³ G10L 1/00**

**U.S. Cl. 381—43** **10 Claims**




1. A method for operating a speech recognition device in which a plurality of rectified channel signals of different frequencies are derived from the speech signal of a spoken word, said channel signals being periodically sampled and digitized to produce digital signals which are stored in a digital memory and compared with a plurality of stored groups of corresponding comparison signals, and in which the group of comparison signals producing the best coincidence is employed as the recognition result, comprising the steps of modifying one of said digital signals having a channel-time pattern (P11 . . . Pmn) by suppressing bits belonging to a prescribed group of sampled

values or storing multiple copies of bits belonging to said prescribed group, said group being prescribed as a function of the overall number (m) of sampling operations which take place within the acoustical word duration, so that the modified channel-time pattern (P11' . . . Pnm') correspond to a standardized plurality (p) of sampling operations, and comparing the modified channel-time pattern (P11' . . . Pnp') with the stored groups of corresponding patterns of comparison signals.

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**4,423,292**

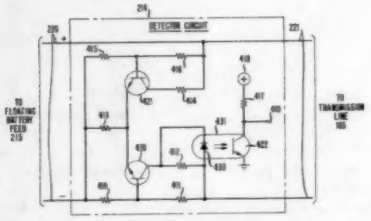
**DETECTOR CIRCUIT FOR COMMUNICATION LINES**

**Gregory J. Turek, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Sep. 30, 1981, Ser. No. 306,943**

**Int. Cl.³ H04M 3/22**

**U.S. Cl. 179—18 FA** **13 Claims**




1. A detector circuit for detecting on-hook and off-hook states of a communication line electrically isolated from ground; said circuit comprising:

current sensor means electrically isolated from ground and responsive to current in said line for generating a first reference signal;

voltage sensor means electrically isolated from ground and responsive to voltage on said line for generating a second reference signal, said reference signals being of like kind; and

comparator means electrically isolated from ground for comparing said reference signals to generate a first output signal representative of said on-hook state when the magnitude of one of said reference signals is greater than the magnitude of the other and a second output signal representative of said off-hook state when the magnitude of said one of said reference signals is less than the magnitude of the other.

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**4,423,293**

**MICROPHONE HOLDING DEVICE**

**Masato Murayama, Kawagoe, and Tetsuyuki Manaka, Otonemachi, both of Japan, assignors to Clarion Co., Ltd., Tokyo, Japan**

**Filed Jun. 12, 1981, Ser. No. 273,136**

**Claims priority, application Japan, Jun. 16, 1980, 55-84066[U]**

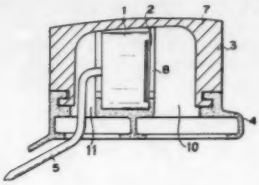
**Int. Cl.³ H04R 1/28**

**U.S. Cl. 179—156 R** **8 Claims**

1. A microphone holding device which comprises:

a microphone having a sound collecting portion at one end and another end opposite said sound collecting portion; and

a microphone holder for holding said sound collecting portion of said microphone substantially perpendicular to the surface of the adjacent wall of a body in which said microphone is mounted, said microphone holder comprising a casing containing the microphone and having a box-like configuration having an open side with at least 2 openings, said 2 openings communicating with said sound collecting portion and said other end of said microphone, respectively, thus to keep both said sound collecting portion and




said other end of said microphone in free communication with the outside of the microphone holder.

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**4,423,294**

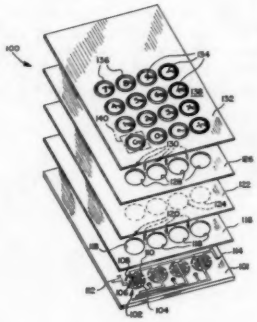
**LAMINATE SWITCH ASSEMBLY HAVING IMPROVED DURABILITY**

**Richard J. Walser, and Gary M. Wyant, both of Urbana, Ohio, assignors to The Hall Company, Urbana, Ohio**

**Filed Jun. 17, 1982, Ser. No. 389,527**

**Int. Cl.³ H01H 3/12**

**U.S. Cl. 200—5 A** **10 Claims**




1. A laminate switch assembly comprising:

a printed circuit board having at least one pair of electrical contact areas formed thereon;

a tactile dome switch plate having a tensioned tactile dome aligned with each pair of said at least one pair of electrical contact areas on said circuit board and a reinforcing band encircling each tactile dome; and

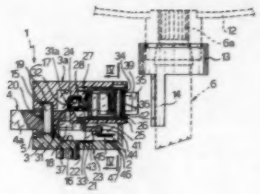
contact means interposed between said circuit board and said switch plate for interconnecting an aligned pair of contact areas upon depression of an associated tensioned tactile dome whereby an electrical connection is completed through said aligned pair of contact areas by depressing said associated tensioned tactile dome and stresses created in said switch plate between said associated tensioned tactile dome and the remainder of said switch plate due to the flexure of said associated tensioned tactile dome are relieved by said reinforcing band which remains substantially stationary compared to the movement of said tactile dome upon depression and release of said associated tensioned tactile dome.

4,423,295

## CONTROL DEVICE FOR OPTICAL AND ACOUSTIC SIGNALERS

Ugo Contato, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Dec. 14, 1981, Ser. No. 330,398
Claims priority, application Italy, Dec. 16, 1980, 53812/80[U]
Int. Cl.³ H01H 3/16
U.S. Cl. 200—61.27 13 Claims



1. A control apparatus for a plurality of vehicle signaling devices in combination with a vehicle steering assembly and including a rotatable steering wheel, comprising:

a. return means associated with said steering wheel and extending thereform and overlying a portion of said steering assembly length;

b. said return means defining generally a circle of operability centered on said steering wheel axis of rotation;

c. a housing positioned adjacent said circle of operability and having first and second spaced aligned opposed openings and said second opening being adjacent said circle of operability;

d. first and second pivot pin means aligned respectively with said first and said second openings;

e. said housing having a base and a plurality of signal contact means associated therewith;

f. a control lever pivotably mounted to said first pivot pin means and having a first portion extending into said housing and a second portion external of said housing and being adapted for pivoting along at least a first axis;

g. disengageable holding means associated with said housing and cooperating with said control lever for holding said control lever in any one of a plurality of pre-determined positions associated with said plurality of signal contact means;

h. said control lever normally being held by said holding means in a first position whereby none of said signaling devices associated with said plurality of signal contact means are activated;

i. said control lever first portion being generally fork shaped with first and second fork sections and being adapted for selectively contacting at least one of said plurality of signal contact means for establishing an electrical circuit from an electrical supply means to an associated signaling device for activitating said associated signaling device when said control lever is selectively pivoted along said at least one axis;

j. first and second cooperating return lever means mounted to said second pivot pin means and being pivotable thereon and each of said return levers having a first portion extending into said housing and a second portion external of said housing;

k. each of said return levers cooperating with an associated one of said fork sections when said control lever is pivoted along said at least one axis whereby one of said fork sections engages an associated return lever first position for pivoting said associated return lever second portion into said circle of operability; and,

l. rotation of said steering wheel causing one of said return means to engage said second portion of said associated return lever for pivoting said associated return lever and whereby said associated return lever first portion engages said associated fork section for pivoting said control lever to said first position.

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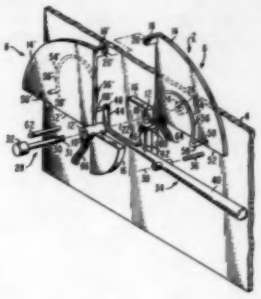
4,423,296

## SHOCK AND VIBRATION RESISTANT ELECTRICAL SWITCH

Joseph F. McSparran, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 18, 1982, Ser. No. 350,089
Int. Cl.³ H01H 3/60
U.S. Cl. 200—67 A 9 Claims



1. An electrical switch comprising:

first and second contact elements, each being secured for rotation about a first axis passing through the center of gravity of that element so that said elements tend to remain stationary in the presence of vibration and shock loads applied to said elements in a direction normal to said axis, said elements each including an electrical contact, said elements being positioned so that when rotated about said axis, their respective contacts engage in a closed switch state and disengage in an open switch state; and

means for selectively placing the contacts in said closed and open states, said means for selectively placing including spring means attached to said elements, said spring means including a pair of springs and a lever secured for rotation about a second axis parallel to said first axis, each spring being attached to said lever, one of said springs being attached to one of said elements and the other spring being attached to the other of said elements, said springs and lever being positioned so that rotation of said lever about said second axis causes said elements to be rapidly placed in said states.

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4,423,297

## STEERING COLUMN SWITCH WITH FLASHER SWITCH

Werner-Ernst Berginski, Werdohl-Eveking, Fed. Rep. of Germany, assignor to Leopold Kostal GmbH & Co. KG, Luedenscheid, Fed. Rep. of Germany

Filed Apr. 16, 1982, Ser. No. 369,034
Claims priority, application Fed. Rep. of Germany, May 30, 1981, 3121659
Int. Cl.³ H01H 9/00, 15/00
U.S. Cl. 200—61.54 11 Claims

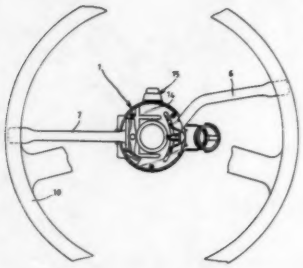
1. In combination with an automobile steering column switch which is disposed about a steering column spindle and has therein a conductor plate in a plane perpendicular to the axis of the steering column spindle, the conductor plate having thereon various electrical circuits which are rendered operative by means of switching levers to control windshield wiper functions, direction light indicator functions and the like of the automobile, a warning flashing switch which fits easily into the

steering column switch and controls the warning flashing light functions of the automobile, comprising:

a switching slider having an annular portion substantially corresponding to the peripheral contour of said conductor plate and proportioned to be disposed between said conductor plate and the housing of said steering column switch,

an activating member on the exterior of said housing and coupled to said switching slider for slidably operating said switching slider perpendicular to the plane of said conductor plate,

said conductor plate having various electrical circuits on the opposite sides thereof and an outer annular portion, a plurality of electrical contacts on said outer annular portion which project on each of the opposite sides of said conductor plate and which are in electrical contact with



said various electrical circuits for controlling the warning flashing light functions,

said switching slider having thereon a plurality of contact bridges which upon activation of said switching slider by said activating member contacting one of said electrical contacts on said outer annular portion of said conductor plate to establish the electrical circuits to operate the warning flashing light functions of the automobile,

at least two of said plurality of contact bridges on said switching slider being non-flexible and rigidly affixed to said switching slider on each of the opposite sides of said conductor plate, and cooperating with said electrical contacts on said annular portion of said conductor plate upon actuation of said switching slider to contact said electrical contacts to establish stop positions for said switching slider.

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**4,423,298**

## GAS CIRCUIT BREAKER OF RESISTANCE BREAKING TYPE

**Masanori Tsukushi; Youichi Ohshita; Kunio Hirasawa, and Takeshi Takahashi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 15, 1981, Ser. No. 311,741**

**Claims priority, application Japan, Oct. 20, 1980, 55-145803**

**Int. Cl.³ H01H** *33/16*

**U.S. Cl. 200—144 AP** **13 Claims**

1. A gas circuit breaker of resistance breaking type comprising:

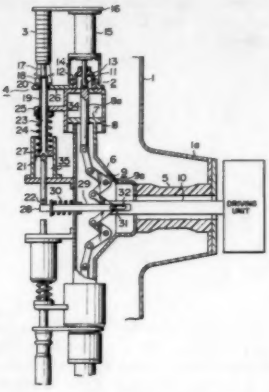
a main breaking unit driven by a drive unit to open and close a circuit;

a resistor and a pair of resistance contacts electrically connected in parllel with said main breaking unit, said pair of resistance contacts including a fixed and movable contact;

spring means for storing a spring force with an action of said drive unit in driving said main breaking unit to open the circuit;

means for coupling said spring means with the movable resistance contact so that said spring means acts, as a source of a drive force, on said movable contact to open said pair of resistance contacts;

locking means for locking said movable contact in a closed position wherein said pair of resistance contacts are closed;



releasing means for releasing the locking effected by said locking means after current in said main breaking unit has been cut off; and

means for transmitting a closing action of said main breaking unit by said drive unit to said movable contact to close said pair of resistance contacts.

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**4,423,299**

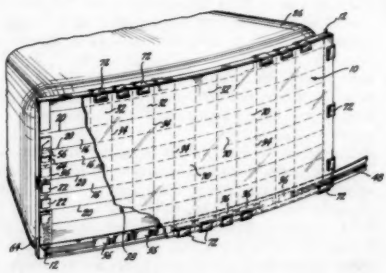
## TOUCH SENSITIVE TRANSPARENT SWITCH ARRAY

**I. Macit Gurol, Seattle, and Gary M. Bang, Edmonds, both of Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.**

**Filed Apr. 20, 1981, Ser. No. 255,677**

**Int. Cl.³ H01H** *9/00, 13/02*

**U.S. Cl. 210—159 B** **27 Claims**



1. A transparent switch array comprising:

a relatively transparent backplate having a first plurality of substantially parallel conductive strips formed on one surface thereof;

a relatively flexible transparent sheet having a second plurality of substantially parallel conductive strips formed on one surface thereof, said flexible sheet and said second plurality of strips being dimensioned and arranged for mounting of said flexible sheet in closely spaced apart, parallel relationship with said transparent backplate with said surface of said flexible sheet including said second plurality of conductive strips facing said surface of said backplate including said first plurality of conductive strips

and with said second plurality of conductive strips being substantially perpendicular to said first plurality of conductive strips, said flexible sheet further including a plurality of bead-like regions formed on said surface of said pliant sheet that include said second plurality of conductive strips and extending outwardly therefrom, said plurality of bead-like regions being arranged in a pattern that positions a first portion of said plurality of bead-like regions between adjacent ones of the conductive strips of said second plurality of conductive strips and positions a second portion of said bead-like regions in alignment with the separation between adjacent ones of said first plurality of conductive strips when said flexible sheet is mounted in said parallel, closely spaced orientation with said backplate; and

means for supporting and maintaining said flexible sheet in said parallel, closely spaced orientation with said surface of said backplate that includes said first plurality of conductive strips, said means for supporting and maintaining said flexible sheet in said parallel, closely spaced orientation with said backplate includes including a flat electrical cable having a plurality of substantially parallel spaced apart conductors extending along one planar surface thereof, said cable being interposed between at least two edge regions of said backplate and said flexible sheet, each of said conductors of said cable being arranged for electrically contacting a conductive strip within one of said first and second pluralities of conductive strips.

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**4,423,300**

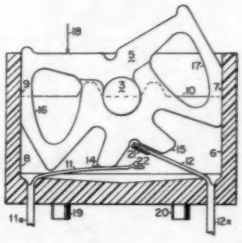
## MANUALLY OPERATED DETENTED SWITCH

**Chesemore, James R., Orange, and Frank J. Bruder, Newport Beach, both of Calif., assignors to EECO Incorporated, Santa Ana, Calif.**

**Continuation-in-part of Ser. No. 326,795, Dec. 3, 1981, abandoned. This application Feb. 25, 1982, Ser. No. 352,504**

**Int. Cl.³ H01H *3/02***

**U.S. Cl. 200—339** **13 Claims**



1. An electro-mechanical switch, comprising;

(a) a hollow housing (1),

(b) a rotor (5) centrally journalled within said housing,

(c) a first cantilever spring contact (12) depressible by said rotor,

(d) a second cantilever spring contact (11) depressible by said first spring contact,

(e) plural, slight deformable rectilinear sides (7,7',9,9') upon said rotor dimensioned in relation to said hollow housing to exclusively force said rotor to occupy plural specific rotational positions, and

(f) plural essentially symmetrical mutually-diverging projections (14,15) upon said rotor,

one said projection (15) to force said spring contacts into mutual mechanical and electrical contact upon said rotor occupying one said specific rotational position, and

another said projection (14) to force said spring contacts out of mutual mechanical and electrical contact upon said rotor occupying another said specific rotational position.

**4,423,301**

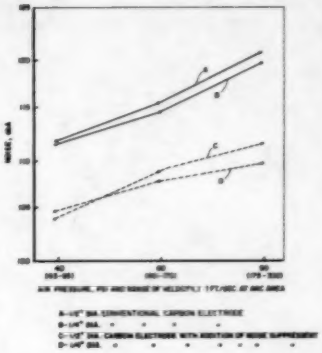
## AIR-CARBON ARC CUTTING AND GOUGING

**Perry J. Rieppel, Worthington, and Raymond A. Sadauskas, Columbus, both of Ohio, assignors to Arcair Company, Lancaster, Ohio**

**Continuation of Ser. No. 172,795, Jul. 8, 1980, abandoned, which is a continuation of Ser. No. 848,817, Nov. 7, 1977, abandoned. This application May 26, 1982, Ser. No. 382,443**

**Int. Cl.³ B23P *1/06***

**U.S. Cl. 219—68** **1 Claim**



1. A method of cutting or gouging a metallic workpiece by the air carbon-arc cutting and gouging process which comprises using as an electrode in the process an electrode formulated to operate at a noise level of at least 5 dbA less than that of a conventional air carbon-arc electrode and consisting essentially of:

at least 50% by weight finely divided carbonaceous material selected from the group consisting of graphite, semigraphite, graphite flour, synthetic graphite, carbon black and mixtures thereof;

an effective amount of a carbonaceous binder; and 3 to 15% by weight noise suppressant selected from the group consisting of a rare earth mixture containing mainly oxides of cerium and lanthanum said rare earth mixture containing a minimum of 80% by weight rare earth oxides having a minimum of 45% by weight cerium oxide and said rare earth mixture mixed with air floated rutile.

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**4,423,302**

## DIGITAL DRIVE APPARATUS FOR EFFECTING CONTROL DISPLACEMENTS IN AN ELECTROEROSIVE MACHINE TOOL

**Akihiko Shimizu, Kawasaki, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan**

**Filed Mar. 23, 1981, Ser. No. 246,415**

**Claims priority, application Japan, Mar. 27, 1980, 55-38238**

**Int. Cl.³ B23P *1/12***

**U.S. Cl. 219—69 G** **6 Claims**

1. A drive apparatus for effecting controlled movements of a movable electrode relative to a counterelectrode along a predetermined axis in an electroerosive machine tool, the apparatus comprising:

a fixed member of the machine tool;

an axial electrode support for securely supporting said movable electrode, said support being slidably carried by said fixed member so as to be movable longitudinally along said axis in a first direction to advance said movable electrode towards said counterelectrode and in a second direction to retract said movable electrode away from said counterelectrode;

a feed screw rotatably carried by said fixed member for rotation about said axis;

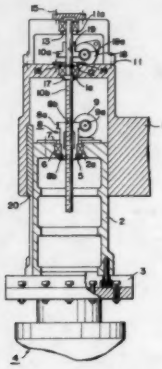
means for holding said feed screw while in rotation against longitudinal displacement relative to said fixed member;

a feed nut coupled in mating engagement with said feed screw and rotatably carried by said axial electrode support for rotation about said axis;

means for holding said feed nut while in rotation against longitudinal displacement relative to said axial electrode support;

a first unidirectionally rotatable motor drivingly coupled to one of said feed screw and said feed nut, constituting a first rotational drive member;

a second unidirectionally rotatable motor drivingly connected to the other of said feed screw and said feed nut,



constituting a second rotational drive member in mating engagement with said first rotational drive member;

a first driver circuit for energizing said first motor with a train of drive pulses to substantially incrementally rotate said first rotational drive member in a predetermined rotary direction, thereby to substantially incrementally move said axial electrode support in said first direction along said predetermined axis; and

a second driver circuit for energizing said second motor with a drive power to rotate said second rotational drive member in said rotary direction, thereby to move said axial electrode support in said second direction along said predetermined axis.

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**4,423,303**

## APPARATUS FOR TREATING POWDERY MATERIALS UTILIZING MICROWAVE PLASMA

**Masahiko Hirose, and Katsutoshi Nishida, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed May 5, 1981, Ser. No. 260,755**

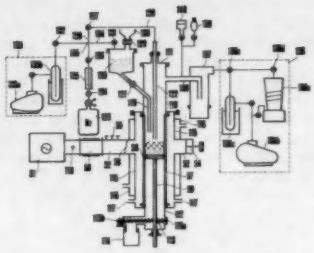
**Claims priority, application Japan, May 6, 1980, 55-58608; Jan. 27, 1981, 56-09661**

**Int. Cl.³ B23K** *9/00, 9/225*

**U.S. Cl. 219—121 P** **7 Claims**

1. An apparatus for treating powdery materials utilizing microwave plasma, comprising means for generating a microwave, a waveguide connected with said microwave generating means, a reaction vessel disposed through said waveguide, means for supplying said reaction vessel with a powdery material to be treated, means for supplying said reaction vessel with a reaction gas, and means for exhausting said reaction vessel;

wherein said reaction vessel comprises a vertically elongated vessel having an upper area air tightly connected to said exhaustion means and a bottom area disposed in said waveguide so that a plasma generating area is formed at the bottom area, said vessel having a central axis and being disposed such that said central axis is oriented substantially in the direction of gravity; and said reaction gas supplying means includes a gas introducing pipe having an outlet located adjacent said bottom area, and including a



movable plate positioned such that said powdery material is supported in said bottom area whereby said powdery material is blown up and agitated by the plasma.

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**4,423,304**

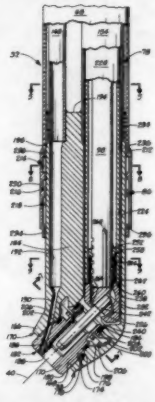
## PLASMA WELDING TORCH

**Harold E. Bass, Rte. 1, Box 31F, Washington, Okla. 73093; James L. Bass, 75 Dufault St., Putnam, Conn. 06260; Richard E. Bass, P.O. Box 44, Washington, Okla. 73093; Peter J. Bass, P.O. Box 128, Dilley, Tex. 78017, and Charles E. Bass, 3613 Trinidad, Norman, Okla. 73069**

**Filed Feb. 20, 1981, Ser. No. 236,141**

**Int. Cl.³ B23K** *9/00*

**U.S. Cl. 219—121 PM** **29 Claims**



1. An improved plasma torch, comprising:

an elongated barrel;

a tubular first electrode mounted at one end of the barrel, the axis of the first electrode oriented at a selected angle to the axis of the barrel;

a rod-like, electrically conducting electrode holder extending axially through the barrel to terminate in an electrode mounting end adjacent one end of the first electrode;

means for fixing portions of the electrode holder near said electrode mounting end thereof to the barrel, remaining portions of the electrode holder being slidably supported within the barrel, wherein a bore substantially coaxial with the bore of the first electrode is formed in the electrode holder; and

a second electrode having one end thereof shaped to mate with the bore formed in the electrode holder, said one end of the second electrode disposed in the bore in the elec-

trode holder, and the second electrode extending from the electrode holder a preselected distance into the first electrode;

wherein the electrode holder and the second electrode are formed of dissimilar metals, the electrode holder being constructed of a metal softer than the second electrode; wherein a tapered surface is formed on the end of the second electrode disposed within the bore of the electrode holder and said bore has a tapered surface to mate with said tapered surface of the second electrode.

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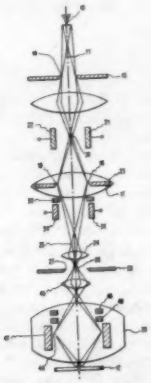
**4,423,305**

## METHOD AND APPARATUS FOR CONTROLLING ALIGNMENT OF AN ELECTRON BEAM OF A VARIABLE SHAPE

**Hans C. Pfeiffer, Ridgefield, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jul. 30, 1981, Ser. No. 288,636**
**Int. Cl.³ B23K *15/00***
**U.S. Cl. 219—121 EU** **18 Claims**



1. An apparatus for controlling the alignment of a beam of charged particles to a target including:

a source of charged particles producing a beam of charged particles along an axis for application to a target;

beam forming means to cause formation of a variable shape of the beam for application to the target;

aperture means disposed along the axis of the beam in a plane having an image of the source and having a first circular aperture through which the beam passes prior to striking the target, said first aperture having a diameter large enough to not substantially affect the current density distribution of the source image in the plane of said aperture means due to shifting of the source image relative to the axis of the beam;

aligning means disposed at a reference location off the axis of the beam in the plane of said aperture means to align the beam at selected times;

and alignment means disposed along the axis of the beam to align the beam solely in accordance with said aligning means.



**4,423,306**

## WELDING CABLE AND EQUIPMENT

**Richard W. Fox, Circleville, Utah 84723**

**Continuation of Ser. No. 207,949, Nov. 18, 1980, abandoned. This application Jul. 22, 1982, Ser. No. 400,595**
**Int. Cl.³ B23K *9/32***
**U.S. Cl. 219—137.9** **1 Claim**

1. Welding equipment comprising

a control cable comprising a plurality of individually insulated control wires bundled together and having a common insulating jacket therearound;

a power cable comprising a power conductive core made of bundled non-insulated core wires surrounded by the common insulating jacket, said power cable having a larger diameter than the control cable whereby an elongate, recessed medial portion is formed in the common insulating jacket at opposite sides of the welding cable between the control cable and the power cable;

color coding means permanently affixed to the control cable and the power cable, said color coding extending into the recessed medial portion formed between the control cable and the power cable at opposite sides of the welding cable to be protected during dragging of the welding cable, whereby upon splitting of a portion of the control cable from the power cable the color coding common to the welding cable will split to become part of each split cable and will be easily viewed as continuing from each opposite side of the welding cable as part of such split apart control and power cables; and

additional color coding means corresponding in color to the color coding means and including means for attachment to a welding machine.

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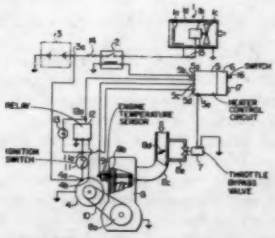
**4,423,307**

## CONTROL SYSTEM FOR ELECTRIC AUTOMOBILE HEATING APPARATUS

**Yasuo Kondo, Okazaki; Masanori Kato, Kariya, and Mitsuru Nakagawa, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan**

**Filed Apr. 24, 1981, Ser. No. 257,118**
**Claims priority, application Japan, Apr. 29, 1980, 55-56767**
**Int. Cl.³ H05B *1/02*; B60H *1/02*; H02P *9/04***
**U.S. Cl. 219—202** **2 Claims**




1. An electric heating apparatus for an automotive vehicle

including an internal combustion engine driving a power generator for charging a battery for supplying power to electrical equipment on the vehicle, and means for supplying an air-fuel mixture to the engine, comprising:

a temperature sensor for detecting a temperature of the engine;

a voltage sensor for detecting a voltage produced at a neutral terminal of the power generator rotated in synchronization with the rotational speed of the engine;

a control circuit responsive to the output signals of said temperature sensor and said voltage sensor for producing a control signal when said temperature sensor detects the temperature of the engine lower than a first predetermined value and said voltage sensor detects said voltage of the power generator higher than a second predetermined value;

rotational speed control means energized responsive to said control signal to increase the air-fuel mixture supplied to the engine;

a power supply switch energized responsive to said control signal for causing the power generator and the battery to provide power supply; and

a warm air generator having an electric heating element energized by the power generator and the battery when said power supply switch is closed.

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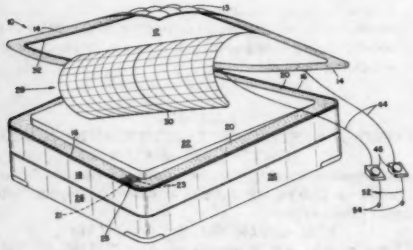
**4,423,308**

## THERMALLY CONTROLLABLE HEATING MATTRESS

**Milton A. Callaway, Jackson, Oreg., and Thomas F. Stutzman, Dunwoody, Ga., assignors to Simmons U.S.A. Corporation, Atlanta, Ga.**

**Filed Jun. 22, 1981, Ser. No. 275,960**
**Int. Cl.³ H05B *3/36***
**U.S. Cl. 219—217** **5 Claims**



1. A thermally controllable heating mattress construction, comprising:

a. a mattress body designed to support a person lying on top thereof;

b. a removable pillow top formed of a quilted mattress liner being supported on said mattress body, means for removably fastening said pillow top to said mattress body along the peripheral edges thereof; and

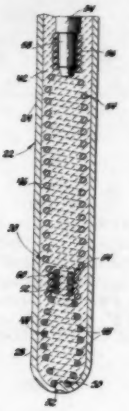
c. a thermal control heating unit including an electrical heating pad liner generally in conformance with the surface of said pillow top, said heating pad liner being removably interposed between the pillow top and mattress body to allow the temperature of the top surface of the mattress to be selectively regulated; and fastener means for removably fastening said heating pad liner to the bottom of said removable pillow top.

**4,423,309**

## QUICK HEAT SELF REGULATING ELECTRIC GLOW HEATER

**Michael P. Murphy, Flint; Gary F. Stack, Grand Blanc; James W. Hoppenrath, Flint, and John R. Taylor, Lapeer, all of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Jun. 28, 1982, Ser. No. 392,600**
**Int. Cl.³ F23Q *7/22***
**U.S. Cl. 219—270** **8 Claims**



1. A self regulating electric resistance glow plug heater for engines or the like and of the type having an elongated electrically conductive tubular sheath having a closed end, a resistance glow coil in the sheath tip near the closed end and a PTC resistance regulating coil in the sheath body remote from the closed end, the coils being connected together at adjacent ends and the glow coil being connected with the sheath tip at the closed end, and electrical conductor means connecting with the regulating coil and the sheath to supply electric current to the coils to generate heat, heat conductive electrical insulation supporting the coils within the sheath and the improvement wherein the coils have spaced heat producing portions and the adjacent ends of the coils form connector portions that are of helical conformation and of reduced diameter relative to the adjacent heat producing portions of their respective coils, said reduced diameter helical connector portions being inserted one inside the other and closely fitted to connect the two coils over extended areas of the connector portions to provide thereby a low resistance, cool operating long life electrical connection between the coils.

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**4,423,310**

## ELECTRICAL STEAM GENERATOR HAVING ADJUSTABLE ELECTRODES FOR AN AIR HUMIDIFIER

**Allen J. Zerbel, Madison, Wis., assignor to Wehr Corporation, Milwaukee, Wis.**

**Filed Apr. 6, 1981, Ser. No. 251,159**
**Int. Cl.³ H05B *3/60*; F22B *1/30***
**U.S. Cl. 219—285** **9 Claims**

1. An electrical steam generator for an air humidifier comprising

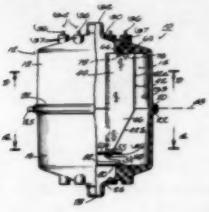
a generally cylindrical, upright water tank including a top wall having a steam outlet, a bottom wall having a water inlet, and a generally vertical side wall;

a plurality of circumferentially-spaced electrical terminals extending through the top wall of said tank at substantially equal intervals and having an inner end projecting inwardly beyond the underside of said top wall

a plurality of electrodes disposed inside said tank, said elec-

trodes having a pair of vertically extending, elongated, generally flat side members which are connected together along an inner edge, which diverge from each other in a direction toward the side wall of said tank and which terminate in an outer edge spaced radially inwardly from the side wall of said tank;

a radially-extending row of radially-spaced internal bosses on the underside of said top wall in conjunction with each of said terminals, each of said internal bosses having a first aperture adapted to receive means for anchoring the upper end of a said electrode to the underside of the top wall of said tank;



a radially-extending row of second apertures in the upper end portion of each of said electrodes, said second apertures being adapted to receive a terminal and being spaced relative to said first apertures such that, when a terminal is positioned in any one of said second apertures, at least one other of said second apertures is in registration with a said first aperture;

means for fastening the upper end of said electrode to the inner end portion of said terminals; and

means for anchoring the upper end portion of said electrode to the underside of the top wall of said tank via said first and second apertures which are in registration.

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**4,423,311**

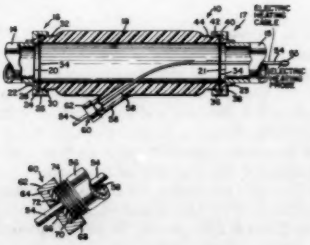
## ELECTRIC HEATING APPARATUS FOR DE-ICING PIPES

**Paul Varney, Sr., Jackson La., Barre, Mass. 01005**

**Filed Jan. 19, 1981, Ser. No. 226,081**

**Int. Cl.³ H05B** *3/56, 3/78;* **E03B** *7/14;* **F16L** *53/00*

**U.S. Cl. 219—306** **7 Claims**



**1.** Apparatus for heating liquid-carrying pipes to prevent freezing of the liquid and thawing of frozen liquid in the pipes, said apparatus comprising:

(a) a housing having a lateral passageway and a central bore connected to an opening at each end of the housing and to the passageway, each end of the housing being provided with external threads and a fitting for sealingly attaching the housing to the open end of a liquid pipe, so that the bore of the housing is effective to connect the open end of a first pipe to the open end of a second pipe, each of said fittings comprising:

(1) a sleeve that is attachable to the end of the pipe and has an outwardly extending annular flange,

(2) a sealing gasket between the annular flange and the end of the housing, and

(3) a coupling nut provided with internal threads for threadingly and engaging the external threads of the housing and an inwardly extending annular flange for engaging and outwardly extending flange of the sleeve,

(b) a sealer valve for sealing the passageway and having an opening with a normally closed penetrable seal of elastomeric material adapted to slidably receive an elongated continuous element and to permit said element to move axially through the valve in a sealed relationship,

(c) electrical control means being mounted on the exterior of the housing and adapted to receive electrical power, and

(d) an elongated heating cable having a first and electrically connected to the control means to receive power therefrom and having a second free end slidably insertable through the penetrable seal of the sealer valve through the passageway into the housing bore and then into one of the pipes through the open end thereof, said cable being provided with a heating element for receiving power through the cable from the control means.

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**4,423,312**

## METHOD FOR HEATING PARISONS MADE OF THERMOPLASTIC MATERIAL

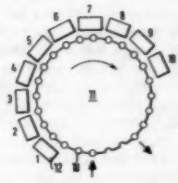
**Walter Wiedenfeld, Tannenweg 28, 2000 Hamburg 62, and Wolfgang Reymann, Falckweg 14, 2000 Hamburg 52, both of Fed. Rep. of Germany**

**Filed Aug. 19, 1982, Ser. No. 409,660**

**Claims priority, application Fed. Rep. of Germany, Sep. 9, 1981, 3135755**

**Int. Cl.³ F27B** *9/06;* **H05B** *1/00;* **B29C** *17/07*

**U.S. Cl. 219—388** **5 Claims**



**1.** A method for heating parisons made of thermoplastic material to a temperature desired for blow molding comprising the steps of

(a) moving the parisons past a plurality of heating boxes,

(b) arranging the heating boxes in the conveying direction of said parisons, each heating box including a plurality of infrared radiator sources located horizontally one above the other,

(c) varying the radiation energy applied to the parisons to provide a temperature profile in the axial direction of said parisons by switching off individually selected radiator sources, and

(d) feeding all the remaining radiator sources with a voltage resulting in maximum light intensity whereby penetration

depth of the radiation energy in the wall of the parison will remain constant.

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**4,423,313**

## TRANSACTION PROCESSING SYSTEM

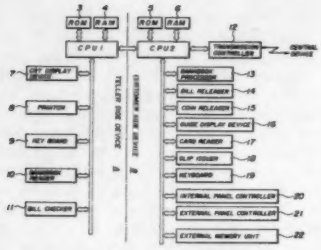
**Shinya Tanigaki, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan**

**Filed Jan. 18, 1982, Ser. No. 340,252**

**Claims priority, application Japan, Jan. 20, 1981, 56-7466; Apr. 14, 1981, 56-56111**

**Int. Cl.³ G06F *15/30***

**U.S. Cl. 235—379** **7 Claims**




1. Transaction processing system, comprising in combination:

tellerside processing means to be operated by a teller for executing processes in the first portion out of a series of processes defining a transaction, including an input device for transaction data in the first portion of a transaction, a first memory for storing said transaction data, and a tellerside display device for displaying said transaction data and the results of a decision about the validity of the transaction;

customerside processing means to be operated by a customer for executing processes in the latter portion of said series of processes including a third memory for storing transaction data in the latter portion of a transaction and a guide display device for displaying the operation procedure to said customer;

decision control means having a second memory for receiving the transaction data from said first memory to be used for making a decision, receiving the decided transaction data from a central device and waiting until the occurrence of a vacancy in said third memory;

communication control means for transmitting said transaction data stored in said second memory for making said decision, receiving return data including said decided transaction data returned from said central device in response to said transmission and storing said return data in said second memory, and displaying the results of the decision about the validity based upon said decided transaction data to said tellerside display device; and

transfer means for transferring said transaction data to said third memory from said second memory after said results of decision.

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**4,423,314**

## TIME RECORDER

**Hiroshi Kato, Atsugi, and Masanori Numata, Yokohama, both of Japan, assignors to Amano Corporation, Yokohama, Japan**

**Filed May 12, 1981, Ser. No. 263,078**

**Claims priority, application Japan, May 12, 1980, 55/62458**

**Int. Cl.³ G06K *1/00***

**U.S. Cl. 235—377** **10 Claims**

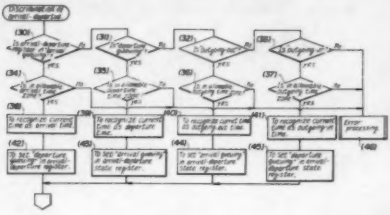
1. A time recorder comprising:

an assembly for receving a time card having recorded thereon information identifying a specific individual and a number of lines in side-by-side columns on which arrival and departure times are to be printed, one of said columns recording arrival times and the other column departure times;

means for reading said information on said card and producing signals containing said information;

memory means for storing for each individual either an arrival queuing status or departure queuing status;

means for producing an output indicating the present time;



printing means movable along the direction of card width between first and second positions for printing the present time in one column in said first position and in the other column in said second position; and

computer means for receiving said information signal and producing a signal to cause said printing means to move in accordance therewith and with the stored status and for changing the stored status.

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**4,423,315**

## TIME RECORDER

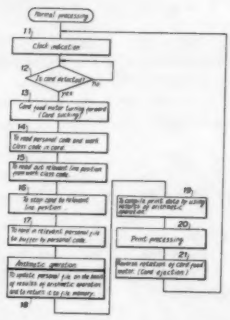
**Hiroshi Kato, Atsugi, and Masanori Numata, Yokohama, both of Japan, assignors to Amano Corporation, Yokohama, Japan**

**Filed May 12, 1981, Ser. No. 263,087**

**Claims priority, application Japan, May 12, 1980, 55-62457**

**Int. Cl.³ G06K *1/00***

**U.S. Cl. 235—377** **7 Claims**



1. A time recorder comprising:

an assembly for receiving a time card having recorded therein information identifying a specific individual and one of a plurality of working hour systems to which that individual is assigned and a number of lines on which arrival and departure times are to be printed;

means for reading said information on said card and producing signals containing said information;

memory means for storing for each said working hour system the times of starting and stopping for at least regular work hours and for storing for each individual daily and accumulative work data;

computer means for receiving said information containing signal and comparing said signal with the information

stored in said memory means to produce a line signal indicating the line to be printed, to produce a print signal indicating the time to be printed at that line and to carry out arithmetical operations to update the stored daily and accumulative work data;

means for producing an output indicating the present time;

means for positioning said card at a predetermined line in response to said line signal; and

means for printing said present time at said predetermined line in response to said print signal.

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**4,423,316**

**AUTOMATIC BANKING SYSTEM**

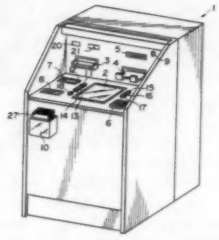
**Zyunzi Sano, Otsu, and Hideki Maeda, Kusatsu, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan**

**Filed Sep. 17, 1981, Ser. No. 303,103**

**Claims priority, application Japan, Sep. 24, 1980, 55-132720**

**Int. Cl.³ G06F *15/30***

**U.S. Cl. 235—379** **8 Claims**



1. An automatic banking system comprising

registered number file means for storing data as to transferer's and transferee's accounts as a registered number for each pair of transferer and transferee account,

selecting means for being selectively actuated by a user to designate if a transferee's account is registered in said registered number file means,

input means for entering a registered number, and

means for searching said registered number file means to find the transferee's account corresponding to said registered number entered through said input means by the user and read detailed data of said found transferee's account.

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**4,423,317**

**MICRO CARD READER**

**Jaroslaw Berezowski, Greenwich, Conn., and Harvey M. Feinman, Bronx, N.Y., assignors to Sealectro Corporation, Mamaroneck, N.Y.**

**Filed Sep. 24, 1981, Ser. No. 305,116**

**Int. Cl.³ G06K *7/10***

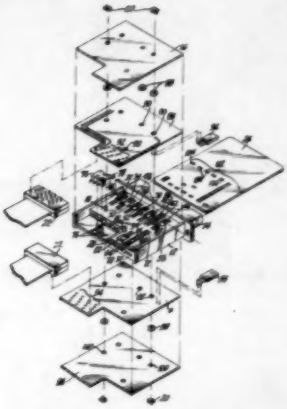
**U.S. Cl. 235—458** **7 Claims**

1. An electro-optical card reader and data card said data card having a plurality of points disposed in columns and rows in the card with selected points allowing light to pass through the card, one said row defining a strobe channel with each of the points in said strobe channel allowing light to pass through said card, the points in the remaining rows defining data points for carrying selected data, said card reader comprising an assembly of components including:

a base member having a planar rectangular slot for slidably receiving the data card, said base member including first and second plates defining opposed sides of said slot, said first and second said plates each having a plurality of data sensing apertures and a strobe sensing aperture extending therethrough, with the data sensing apertures and the strobe sensing aperture in the first plate being in register respectively with the data sensing apertures and the strobe sensing aperture in the second plate to define registered sets of data sensing apertures and a registered set of strobe sensing apertures, said registered set of strobe sensing apertures being disposed in the card reader to be aligned with the strobe channel in the data card when the data card is inserted in the slot, the registered sets of data sensing apertures being disposed in the card reader to be aligned respectively with the rows of data points in the data card when the card is inserted in the slot;

signal generating means disposed within each said data and strobe sensing aperture in the first plate;

signal sensing means disposed with each said data and strobe sensing aperture in the second plate;



electrical data collection means in communication with each said signal generating means and each said signal sensing means, said electrical data collection means being operative to sequentially read each column of the data card, whereby when the card is positioned with the strobe channel aligned with the strobe apertures movement of the data card into or out of the slot in the card reader causes each point in the strobe channel to generate a strobe signal, each said strobe signal being operative to cause the reading of the data points in the respective column of the data card.

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**4,423,318**

**TRANSACTION PROCESSING SYSTEM**

**Kanzen Gotou, Owariasahi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Apr. 16, 1982, Ser. No. 369,027**

**Claims priority, application Japan, Apr. 24, 1981, 56-61217**

**Int. Cl.³ G06F *15/30***

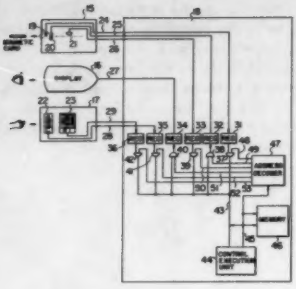
**U.S. Cl. 235—379** **5 Claims**

1. A transaction processing system in an automatic transaction machine for automatically carrying out transactions including cash withdrawal, balance checking and depositing by an operation of an operator, comprising the steps of:

preparing a plurality of processing procedures for each transaction;

displaying an initial operation direction relating to one of the

processing procedures for processing the transaction in accordance with said one processing procedure; and



if an initial operation relating to other processing procedure than displayed is conducted, proceeding the processing in accordance with said other processing procedure.

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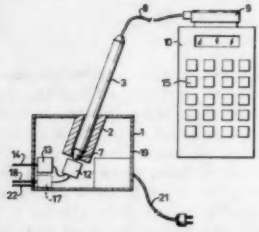
**4,423,319**
**COMMUNICATION LINK**
**Hans Jacobsen, Täby, Sweden, assignor to Micronic AB, Täby, Sweden**
**Filed Jan. 13, 1981, Ser. No. 224,842**
**Int. Cl.³ G06K *7/10***
**U.S. Cl. 235—472** **2 Claims**



1. A communication link for transferring information from a data terminal (10), with connected light pen (3) with a point end (7) which includes a light diode (4) and phototransistor (5) or corresponding means, to a greater computer unit, wherein the communication link (1) includes a light pen holder (2) and an information transferring device, which comprises a transfer phototransistor (11) or the like, and an amplifier (13) to which said phototransistor is connected and said amplifier (13) being adapted to be connected to a greater computer unit or memory unit, said transfer phototransistor (11) being located adjacent said holder (2) whereby said transfer phototransistor (11), when a light pen (3) is inserted in said holder (2), is located close to the point end (7) of the light pen (3), and that the data terminal (10) and light pen (3) in a manner known per se emit light pulses, corresponding to information stored in the data terminal (10), by the light diode (4) of the light pen, which pulses are intended to activate said transfer phototransistor (11) for transferring the pulses via said amplifier further to the greater computer unit by electric signals, said communication link being further characterized in that said information transferring device also includes a transfer light diode (16) located adjacent said transfer phototransistor (11), and a second amplifier (17) to which said transfer light diode (16) is connected and said second amplifier (17) being adapted to be connected to a greater computer unit, said transfer light diode (16) emits light pulses corresponding to instructions to the data terminal (10) arriving from the greater computer unit via said amplifier (17), and that the phototransistor (5) of the light pen (3) when the light pen is in said holder (2) is arranged to receive light pulses from said transfer light diode (16) and to transfer such pulses to the data terminal (10) via electric signals, where the data terminal (10) is arranged to receive such instructions.

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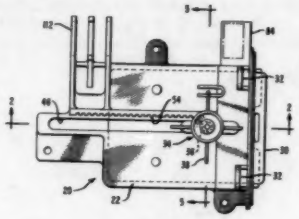
**4,423,320**
**ENCODED CARD READER**
**Bruce M. McPherson, Maitland, Fla., assignor to NCR Corporation, Dayton, Ohio**
**Filed Mar. 17, 1982, Ser. No. 358,933**
**Int. Cl.³ G06K *13/00***
**U.S. Cl. 235—482** **6 Claims**



1. An apparatus for reading a record member having data representing indicia comprising:

a first housing assembly having a supporting surface for slidably supporting a record member for movement between a home position and a displaced position and an enclosure member mounted on said supporting surface having a first drive portion;

a second housing assembly slidably mounted on said enclosure member and engaged by a record member positioned on said supporting surface for movement by said record member between a home and displaced position;

a spring member interconnected between the first and second housing assembly for urging said second housing assembly and the record member from the displaced position to the home position;

means mounted on said first housing assembly for sensing the indicia of the record member during the movement of the record member from the displaced position to the home position;

and a speed limiting device rotatably mounted on said second housing assembly including a support member rotatably secured to said second housing assembly having a second drive portion engaging said first drive portion and a plurality of vane members extending outwardly therefrom, said support member adapted to be rotated by said first and second drive portions during the movement of said second housing assembly under urgence of said spring member whereby the rotation of said vane members limits the movement of said second housing member past said sensing means to a constant speed.

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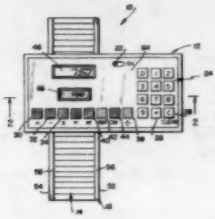
**4,423,321**
**CALCULATING SYSTEM**
**Ira Wilkow, 8500 Boulevard E., North Bergen, N.J. 07047**
**Filed Aug. 10, 1981, Ser. No. 291,458**
**Int. Cl.³ G09B *7/00***
**U.S. Cl. 235—489** **9 Claims**

1. A calculating system for simplified problem solving, the system comprising a user readable set of successive instructions, a columnar array of spaces, the columnar array of spaces being formed on sheet material, the array of spaces being correlated to the instruction set for user entry of data directly thereon pursuant to instructions of the instruction set, a plurality of the spaces including preprinted visible indicia thereon,

the visible indicia being correlated to an algorithmic mathematical function which is related to the data to be user entered upon each of the plurality of spaces in solving a problem, an electronic calculator, the calculator including a plurality of numeral entry keys and a plurality of function keys, each function key including indicia visually associated therewith, the preprinted indicia appearing in selected spaces of the co-



lumnar array corresponding to matching indicia associated with a function key, menas associated with the electronic calculator for selectively exposing successive spaces of the columnar array whereby a user will depress function keys of the electronic calculator having indicia corresponding to the preprinted indicia appearing in successive spaces for performing an algorithm to solve the problem.

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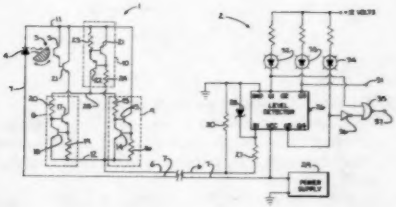
**4,423,322**

## SELF DIAGNOSTIC SWITCH CIRCUIT

**Enoch P. Smith, Greendale, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.**

**Filed Sep. 24, 1981, Ser. No. 305,121**
**Int. Cl.³ G01D 5/34**
**U.S. Cl. 250—229** **3 Claims**



1. A switch circuit which comprises:

a power supply connected to provide current through leads;

means coupled to the leads for detecting the amount of current delivered by the power supply;

a series circuit connected across said leads and including a light sensor connected in series with a first current drain, the series circuit being operable when light is received at the light sensor to conduct current;

a second current drain connected across the leads and in parallel with the series circuit, the second current drain being operable to conduct a preselected minimum amount of current;

light emitting means connected to conduct current which is supplied by the power supply through the leads and being positioned to emit light on the light sensor;

shutter means positioned to block the light applied to the light sensor when the shutter means is in one operating position and to allow the light to be applied to the light sensor when the shutter means is in a second operating position;

wherein the means for detecting the amount of current delivered by the power supply includes:

first means for providing an indication that the current has dropped below a level less than that conducted by the second current drain;

second means for providing an indication that the current has risen above a level which is greater than the sum of the currents conducted by the first and second current drains; and

third means for providing an indication that the current has reached a level which is greater than that conducted by the second current drain, but less than the sum of the currents conducted by the first and second current drains.

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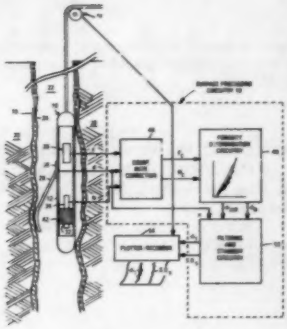
**4,423,323**

## NEUTRON LOGGING METHOD AND APPARATUS FOR DETERMINING A FORMATION CHARACTERISTIC FREE OF ENVIRONMENTAL EFFECTS

**Darwin V. Ellis, Ridgefield, and Charles Flaum, Danbury, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.**

**Filed Sep. 9, 1981, Ser. No. 300,418**
**Int. Cl.³ G01V 5/00**
**U.S. Cl. 250—264** **49 Claims**



1. A method for determining the porosity of a sub-surface geological formation traversed by a borehole comprising the steps of:

a. passing a neutron logging tool through said borehole while irradiating said formation with neutrons, said neutron logging tool including a neutron source and first and second detectors spaced from said source by different distances;

b. generating first and second detector signals indicative of interactions between said neutrons and the nuclei of materials in the vicinity of said detectors;

c. automatically combining said first and second detector signals into a tangible representation of formation porosity inherently free of effects due to tool standoff from said borehole wall without explicitly determining said standoff.

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**4,423,324**

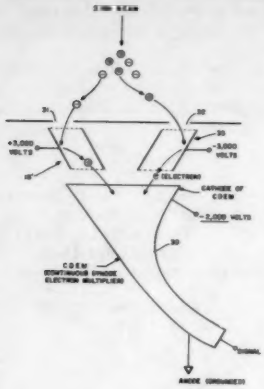
## APPARATUS FOR DETECTING NEGATIVE IONS

**George C. Stafford, San Jose, Calif., assignor to Finnigan Corporation, Sunnyvale, Calif.**

**Continuation of Ser. No. 897,150, Apr. 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 790,148, Apr. 22, 1977, abandoned. This application Jul. 23, 1979, Ser. No. 59,961**
**Int. Cl.³ B01D 59/44; H01J 27/00**
**U.S. Cl. 250—281** **7 Claims**

1. Apparatus for detecting the abundance of negative ions from a source of such ions comprising: conversion means maintained at a high positive voltage for attracting and accelerating only said negative ions whereby the negative ions impact the conversion means with sufficient kinetic energy to

produce a proportional amount of secondary positive ions, and electron multiplier means having an input operated at a negative potential to attract said secondary positive ions and for providing an output signal indicative of the abundance of said negative ions.



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**4,423,325**

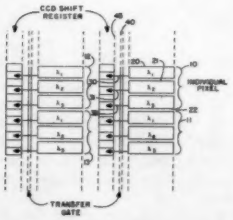
**MULTI-SPECTRAL SCHOTTKY BARRIER INFRARED RADIATION DETECTION ARRAY**

**Norman A. Foss, North Oaks, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Sep. 2, 1981, Ser. No. 298,568**

**Int. Cl.³ H01J *31/49*; G01T *1/22***.

**U.S. Cl. 250—332** **10 Claims**



**1. An infrared detector array comprising:**

**a plurality of pixels for sensing infrared radiation, each pixel comprising a plurality of Schottky barrier detectors, each detector in a pixel having a different barrier height so as to produce an output for each pixel indicative of infrared radiation of a different wavelength.**

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**4,423,326**

**FIRE OR EXPLOSION DETECTION**

**David N. Ball, Slough, England, assignor to Graviner Limited, Great Britain**

**Filed Dec. 9, 1981, Ser. No. 328,882**

**Claims priority, application United Kingdom, Dec. 12, 1980, 8039929**

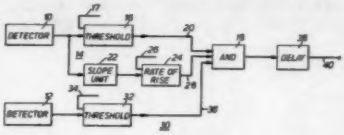
**Int. Cl.³ G01J *1/00***

**U.S. Cl. 250—339** **11 Claims**

**1. A fire and explosion detection system for discriminating between radiation produced by a source of fire or explosion to be detected and radiation produced by a source of fire not to be detected, comprising**

**first and second radiation detecting means respectively responsive to radiation in different wavelength bands to produce first and second electrical signals respectively, and**

**output means connected to monitor the first and second electrical signals and operative to produce a fire or explosion indicating output only when, for at least a predetermined period of time, the magnitude of each signal exceeds a respective predetermined value and the rate of rise of at least the said first signal exceeds a predetermined value.**



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**4,423,327**

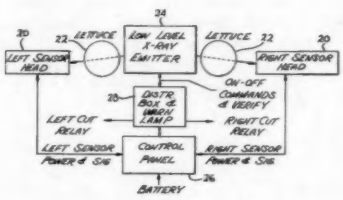
**FOOD STUFF MATURITY SENSING AND INSPECTION APPARATUS**

**Richard Alexander, 5333 Sepulveda Blvd., No. 3, Culver City, Calif. 90230**

**Filed Oct. 10, 1978, Ser. No. 949,944**

**Int. Cl.³ G01N *23/00***

**U.S. Cl. 250—358.1** **6 Claims**



**1. A food stuff inspecting system comprising:**

**(a) a cadmium 109 source of low level x-ray radiation for directing radiation through produce in an amount inversely exponentially responsive to the density of the food stuff;**

**(b) a radiation detector for providing a detector signal responsive to emission incident thereto, said detector being cooperatively disposed with respect to said radiation source to receive emission therefrom passing through the food stuff; and**

**(c) signal processing means for processing said detector signal to determine occurrence of a predetermined characteristic in the food stuff, said signal processing means comprising:**

**(i) first electrical translation means for receiving said detection signal and outputting a signal responsive thereto;**

**(2) a logarithmic amplifier, the input thereof being connected to the output of said electrical translation means, the output of said logarithmic amplifier being the logarithm of the signal output from said electrical translation means;**

**(3) second electrical translation means for standardizing the detection signal, the input of said second electrical translation means being connected to the output of said logarithmic amplifier;**

**(4) a first comparator having first and second inputs and a comparator output, said first input being connected to the output of said second electrical translation means, the second input being connected to means for produc-**

ing an electrical signal responsive to a first state of the food stuff being inspected;

(5) a second comparator having first and second inputs and a comparator output, said first input being connected to the output of said second electrical translation means, the second input being connected to means for producing an electrical signal responsive to a second state of the food stuff being inspected, the comparator outputs of said first and second comparators being connected to one another whereby the connected comparator outputs of said first and second comparators produce a signal output only when the signal output from said second electrical translation means is intermediate the levels of the electrical signals responsive to the first and second states of the food stuff being inspected;

(6) feedback amplifier means for detecting a change in the polarity of the electrical signal input thereto and producing a linear output signal responsive thereto, said feedback amplifier means having first and second inputs, said first input connected to the outut of said second electrical translation means, the linear output signal of said feedback amplifier means being coupled to the second input thereof; and

(7) pulse means for producing a signal responsive to an acceptable state of the food stuff being inspected, said pulse means being connected to the output of said feedback amplifier and said first and second comparators whereby the output signal of said pulse means is responsive to the output signals of said feedback amplifier and said first and second comparators.

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**4,423,328**

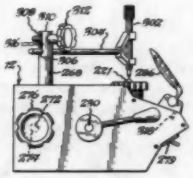
## MEASURING SYSTEM FOR USE IN THE RADIATION MEASUREMENT OF LAYER THICKNESSES AND THE LIKE

**Jerry J. Spongr, Tonawanda; John E. Tiebor, Williamsville, and Boris B. Joffe, Buffalo, all of N.Y., assignors to Twin City International Inc., Amherst, N.Y.**

**Continuation of Ser. No. 203,873, Nov. 4, 1983, abandoned. This application Aug. 5, 1982, Ser. No. 405,442**

**Int. Cl.³ G01N *23/00***

**U.S. Cl. 250—358.1** **16 Claims**



1. A measuring system for use in the radiation measurement of layer thicknesses comprising a stand having means for supporting a workpiece to be measured, a probe body having a radiation source and a radiation detector, said probe body being movable for the mesurement of a workpiece in both a first and a second position of orientation of said probe body, support means for removably supporting said probe body on said stand in said first position of orientation for measuring a workpiece supported on said stand and said probe body being removable said stand for use in said second position of orientation for measuring a workpiece supported by said probe body, said probe body being self-supporting in said first position of orientation independently of said stand upon removal from said stand and placement directly on a workpiece or another workpiece supporting surface, and said probe body also being self-supporting on a supporting surface upon removal from said stand and placement in said second position of orientation, said probe body including means to support a workpiece to be measured when in said second position of orientation.

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**4,423,329**

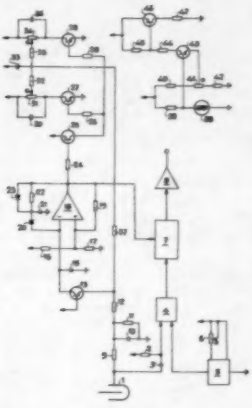
## GAMMA RADIATION DETECTOR PROBE WITH A HALOGEN-QUENCHED GEIGER-MÜLLER TUBE, COMPENSATED FOR DEAD TIME

**Eduardo De Burgos Garcia; A. Javier Goni Unzue; Juan M. Gutierrez Barranco, and Juan A. Pajares Suarez, all of Madrid, Spain, assignors to Junta de Energia Nuclear, Madrid, Spain**

**Filed Nov. 17, 1980, Ser. No. 207,512**

**Int. Cl.³ G01T *1/18***

**U.S. Cl. 250—374** **5 Claims**



1. A Geiger-Müller (GM) tube gamma radiation probe which compensates for pulse losses due to GM tube dead time and linearizes the count-rate versus exposure-rate response of the tube, said probe comprising:

(a) current-to-frequency converter means for converging the GM tube means current due to radiation into pulses, the frequency of which is dependent on said GM tube current;

(b) shaping means for shaping the GM tube pulses to radiation incident on the GM tube;

(c) mixing means for adding or mixing the GM tube pulses with the pulses supplied by said current-to-frequency converter means; and

(d) logarithmic network feedback means connected to said current-to-frequency converter means, said logarithmic network feedback means including two control means for adjusting the pulse frequency of said current-to-frequency converter means at both low and high exposure rates so that the response of the tube is linearized over its whole measuring range.

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**4,423,330**

## NORMALLY OFF BILATERAL SWITCH

**Mahoud A. El Hamamsy, Watchung, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

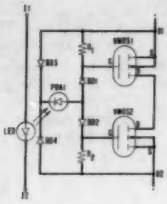
**Filed Sep. 24, 1981, Ser. No. 305,131**

**Int. Cl.³ G02B *27/00*; H03K *17/687***

**U.S. Cl. 250—551** **6 Claims**

1. A switch comprising a first photodiode array, said array having first and second terminals, a first and a second field effect transistor (FET), each FET having source, gate and drain electrodes, said drain electrodes being commonly connected, first and second diodes, each being connected to said first terminal of said first photodiode array and said first and

second diodes being connected to said gate electrodes of said first and second FETs, respectively, third and fourth diodes each being connected to said second terminal of said first photodiode array and said third and fourth diodes being connected to said source electrodes of said first and second FETs, respectively, and first and second resistances connected between gate and source electrodes of said first and second FETs, respectively.



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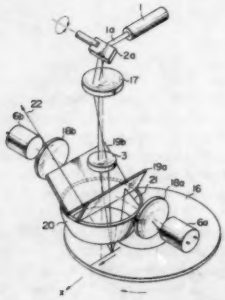
4,423,331

## METHOD AND APPARATUS FOR INSPECTING SPECIMEN SURFACE

Mitsuyoshi Koizumi; Nobuyuki Akiyama, and Yoshimasa Oshima, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 11, 1981, Ser. No. 242,483
Claims priority, application Japan, Mar. 12, 1980, 55-30396
Int. Cl.³ G01N 21/88
U.S. Cl. 250—572 6 Claims



1. An apparatus for inspecting a defect or the like on a surface of a disc having a cutting mark constituted by fine grooves extending in the circular direction of the disc and with random intervals in the radial direction of the disc, the apparatus comprising:

laser oscillator means for producing a laser beam;

laser spot irradiation means for irradiating the surface of the disc with the laser beam in the form of a focused laser spot projected substantially perpendicularly to the plane of the disc surface, whereby defects or the like on the surface of the disc cause light of the focused laser spot to be irregularly scattered therefrom;

scanning means including laser scanning means for scanning the laser spot in the radial direction of the disc and rotation driving means for rotating the disc and for two-dimensionally scanning the surface of the disc with the laser spot;

photoelectric converter means including a plurality of photoelectric converters;

optical means for conducting light irregularly scattered by defects or the like other than the cutting mark on the disc along light detecting path means of said plurality of photoelectric converters, said optical means including a first mirror having a concave inner mirror surface of revolution and disposed with respect to the surface of the disc so as to reflect light irregularly scattered therefrom, a pair of second mirrors associated with said first mirror and disposed symmetrically to each other for deflecting irregularly scattered light reflected by said first mirror which is in a direction other than the radial direction of the disc into the light detecting path means of said plurality of photoelectric converters and for permitting light reflected from the cutting mark to pass out of the light detecting path means of said plurality of photoelectric converters, and a plurality of condenser lenses for focusing light reflected by said pair of second mirrors onto said plurality of photoelectric converters, said plurality of photoelectric converters providing output signals in response to the light detected thereby, and

adding circuit means for adding the output signals of said plurality of photoelectric converters to produce an output signal indicative of the presence or absence of a defect or the like on the surface of the disc.

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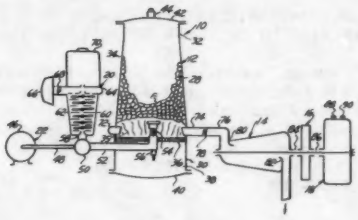
4,423,332

## PORTABLE SOLID FUEL ELECTRIC POWER PLANT FOR ELECTRICAL POWERED VEHICLES

Werner H. Fengler, 23651 Fordson Dr., Dearborn, Mich. 48124

Continuation-in-part of Ser. No. 13,984, Feb. 22, 1979, abandoned. This application Dec. 10, 1980, Ser. No. 214,848
Int. Cl.³ F02C 3/26; H02P 9/04
U.S. Cl. 290—45 12 Claims



1. A portable slow-burning solid fuel power plant system for a hybrid vehicle, said system comprising:

combustion receptacle means having a combustion chamber therein adapted to burn and convert pieces of slow-burning solid fuel into a pressurized power gas, said combustion receptacle means having an air inlet and a power gas outlet,

a power-gas-operated turbine having a power gas inlet portion and an exhaust gas outlet portion and a rotary power output member,

conduit means for conveying power gas from said outlet of said combustion receptacle means to said inlet portion of said turbine,

an electrical storage device,

an alternator having a rotary power input member and electric current output terminals adapted to deliver the electric current generated by said alternator to said electrical storage device in response to its drive by said power-gas-operated turbine,

a speed reducer operatively connecting said rotary power output member of said turbine to said rotary power input member of said alternator,

means for selectively supplying a combustible starting fluid to said combustion receptacle means,

means associated with said combustion receptacle means for controllably igniting said combustible starting fluid, and

means responsive to the amount of charge contained in said

storage device for supplying air under pressure to said combustion receptacle air inlet whenever said storage device is not in its fully charged condition.

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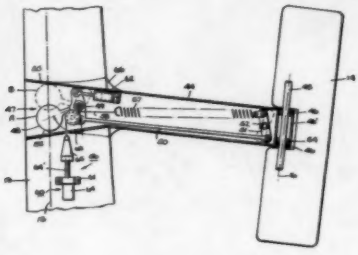
4,423,333

## HORIZONTAL AXIS WIND ENERGY CONVERSION SYSTEM WITH AERODYNAMIC BLADE PITCH CONTROL

Wendell E. Rossman, 3137 N. 53rd St., Phoenix, Ariz. 84018

Filed Feb. 2, 1982, Ser. No. 344,957
Int. Cl.³ F03D 7/04
U.S. Cl. 290—44 34 Claims



1. A wind energy conversion system comprising

a rotor assembly disposed on a horizontal axis, said rotor assembly including at least one pivotally mounted turbine blade disposed in a radiating manner for rotation about an aerodynamic axis perpendicular to said horizontal axis, and a pitch control vane mounted on said turbine blade for moving said turbine blade into a deliberate angle of attack in relation to a relative wind passing over said blade.

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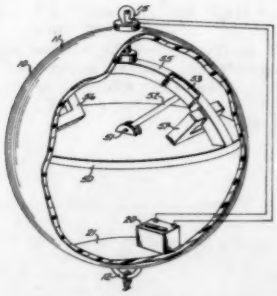
4,423,334

## WAVE MOTION ELECTRIC GENERATOR

Edgar F. Jacobi, 1027 Woodland Pl., Menasha, Wis. 54952, and Robert J. Winkler, 2101 E. 4th St., Ste. 150, Santa Ana, Calif. 92704

Filed Sep. 28, 1979, Ser. No. 79,974
Int. Cl.³ F03B 13/12
U.S. Cl. 290—53 1 Claim



1. A wave motion powered electrical generator comprising:

a substantially spherical hollow buoyant structure having a sealed exterior shell;

a ballast weight mounted at a selected point on the interior of said buoyant structure for providing a preferred flotation alignment therefore when deployed on a body of liquid;

a support platfrom disposed on the interior of said buoyant structure on said ballast weight and aligned along a horizontal plane an arcuate pivotal guide mounted on said support platform in a vertical plane relative thereto;

a pivoted arm aligned for pivotal articulation in a vertical plane above said platform a weighted head conformed for receipt in said arcuate guide on the free end of said pivotal arm, said head having a substantially arcuate plan form extending as arc segments relative said pivoted arm each said arc segment being respectively provided with a first and second winding connected in a series circuit;

a first and second magnetic loop mounted on said arcuate guide proximate the ends thereof, each magnetic loop including an air gap aligned to receive a corresponding one of said arcuate segments of said head according to the pivotal articulation thereof wherein said first or second windings are respectively passed through the corresponding ones of said air gap according to the pivotal motion of said arm; and

rectifying means connected to said first and second winding for rectifying the induced currents therein.

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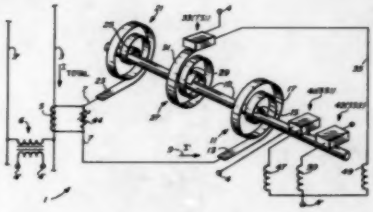
4,423,335

## ENERGY CONTROLLER AND METHOD UTILIZING BI-METAL ELEMENTS TO ADJUST THERMOSTAT SETTING AND TO SHED AND RESTORE CONTROLLED LOADS IN PRIORITIZED ORDER

George P. Gurr, Phoenix, Ariz., assignor to Cyborex Laboratories, Inc., Phoenix, Ariz.

Filed Jan. 4, 1982, Ser. No. 336,939
Int. Cl.³ H02J 3/14
U.S. Cl. 307—31 24 Claims



1. A system for controlling the amount of electrical energy delivered from a power line to an establishment having a plurality of electrical loads, including first and second controlled loads, in order to reduce peak electrical loading by the establishment by avoiding simultaneous operation of said first and second controlled loads, said system comprising in combination:

(a) means for sensing a quantity related to the amount of power being delivered to said plurality of electrical loads;

(b) first temperature sensitive means having a portion that deflects in response to a change in the temperature of said first temperature sensitive means caused by a change in said quantity, wherein said first temperature sensitive means includes a first bi-metal coil having a first end portion and a second end portion, said second end portion undergoing rotational deflection relative to said first end portion in response to changes in temperature of said first bi-metal coil;

(c) means responsive to said sensing means for heating said first temperature sensitive means to a temperature related to the amount of power being delivered to said plurality of electrical loads;

(d) thermostatic means for switching from one state to another when a temperature of said thermostatic means varies from a level below a first set point temperature to a level above said first set point temperature, said first thermostatic means controlling said first controlled load, wherein said thermostatic means includes a second bi-metal coil having a first end portion and a second end

portion that undergoes rotational deflection relative to said first end portion of said second bi-metal coil in response to changes in the temperature of said second bi-metal coil, said coupling means connecting said second end portion of said first bi-metal coil to said first end portion of said second bi-metal coil, the total amount of rotational deflection of said second end portion of said second bi-metal coil being determined by both an amount of change of temperature of said second bi-metal coil and an amount of change in the total power being delivered to the establishment; and

(e) means coupling said thermostatic means to said portion of said first temperature sensitive means for changing said first set point temperature in response to changes in the amount of power being delivered to said plurality of electrical loads.

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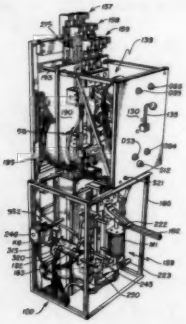
**4,423,336**

## ELECTROMECHANICALLY CONTROLLED AUTOMATIC TRANSFER SWITCH AND BYPASS SWITCH ASSEMBLY

**James R. Iverson, Fridley; Ernest L. Tell, and Terry L. Pinotti, both of Mounds View, all of Minn., assignors to McGraw-Edison Company, Rolling Meadows, Ill.**

**Filed May 17, 1982, Ser. No. 378,642**
**Int. Cl.³ H02J** *7/00*
**U.S. Cl. 307—64** **23 Claims**



1. An automatic transfer switch and bypass switch assembly for interconnecting a normal source of power or an alternate source of power to a load, comprising:

a. a three postion motor operated transfer switch having three alternative postions; an open position, a position for connecting the normal source of power to the load, and a position for connecting the alternate source of power to the load;

b. a three position manually operated bypass switch for bypassing the automatic transfer switch and alternatively connecting the load to the normal source of power, or to the alternate source of power, or to neither source of power;

c. position sensing means for sensing the position of said transfer switch and the position of said bypass switch;

d. power sensing means for sensing the availability of both the normal and the emergency sources of power;

e. operation sensing means for sensing when said bypass switch is being manually operated to connect the normal source of power to the load or to connect the alternate source of power to the load; and

f. automatic means, electromachanically interlocking said transfer switch and said bypass switch and operating in response to said position sensing means, said power sensory means and said operation sensing means, for actuating said transfer switch to disconnect the load from the source of power to which said transfer switch is connecting the load if said bypass switch is manually operated to connect the other source of power to the load.

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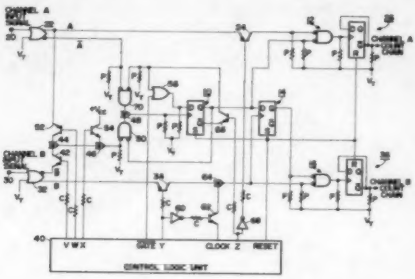
**4,423,337**

## GATE CIRCUIT FOR A UNIVERSAL COUNTER

**William G. Wilke, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.**

**Filed Jul. 13, 1981, Ser. No. 282,368**
**Int. Cl.³ H03K** *17/26*
**U.S. Cl. 307—247 R** **4 Claims**



1. A gating circuit for an electronic counter, comprising:

a first bistable control circuit responsive to an arming signal and a first triggering signal for producing a first enable signal, said first triggering signal being selectable from a first input signal and a second input signal;

a first gate circuit responsive to said first enable signal for producing a first count signal;

means for applying said first input signal to said first gate circuit;

a second bistable control circuit responsive to said first enable signal and a second triggering signal for producing a second enable signal, said second triggering signal being selectable from said second input signal and a clock signal; and

a second gate circuit responsive to said second enable signal and said second triggering signal for producing a second count signal.

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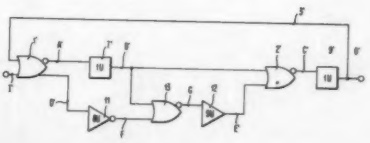
**4,423,338**

## SINGLE SHOT MULTIVIBRATOR HAVING REDUCED RECOVERY TIME

**David B. Eardley, Stanfordville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Mar. 1, 1982, Ser. No. 353,455**
**Int. Cl.³ H03K** *5/159, 3/033*
**U.S. Cl. 307—273** **6 Claims**



1. A single shot multivibrator comprising

first and second logic circuits, each having two inputs, and at least one output,

said first circuit being directly connected to one input of said second circuit and, via a delay circuit, to the other input of said second circuit,

said output of said second circuit being directly connected to an output terminal and to one input of said first circuit,
the other input of said first circuit being connected to an input terminal,
said delay circuit comprising a number of cascaded delay units, at least two of which are directly connected to said first circuit.

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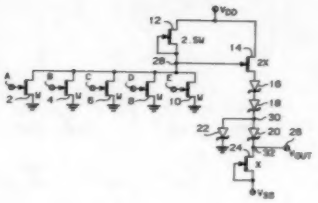
## 4,423,339
## MAJORITY LOGIC GATE

Walter C. Seelbach, Fountain Hills, and Boyd K. Hansen, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 23, 1981, Ser. No. 237,310
Int. Cl.³ H03K 19/23, 19/092, 19/094, 5/08
U.S. Cl. 307—464 5 Claims




1. A logic gate, comprising:
an input stage having an odd number of inputs, said input stage producing a first voltage when a majority of said inputs are coupled to a logical high voltage level and producing a second voltage when a majority of said inputs are coupled to a logical low voltage level, said input stage including,
an odd plurality of field effect transistors having a common drain and each having a source coupled to ground, the gate electrode of each of said field effect transistors comprising one of said odd number of inputs, and
a load field effect transistor having its source electrode coupled to its gate electrode and to the drain electrodes of said odd plurality of field effect transistors, said load field effect transistor having a drain electrode, coupled to a source of supply voltage, said first and second voltages being produced at the source of said load field effect transistor, each of said odd plurality of field effect transistors having a channel width such that a majority of said odd plurality of field effect transistors must be on to sink all current being sourced by said load field effect transistor;
level shifting means coupled to said input stage for shifting said second and first voltages to produce said logical high and logical low voltages respectively, said level shifting means including,
a source follower field effect transistor having a gate electrode coupled to the source of said load field effect transistor, a drain electrode coupled to said source of supply voltage and having a source electrode,
first, second and third series coupled Schottky diodes, the first of which having an anode coupled to the source of said source follower field effect transistor, and
an additional field effect transistor having a source electrode coupled to its gate electrode and to a second source of supply voltage and having a drain electrode coupled to the cathode of said third Schottky diode, said logical high and logical low voltages appearing at the drain electrode of said additional field effect transistor, said source follower field effect transistor being capable of conducting twice as much current as said additional field effect transistor; and
an additional Schottky diode having a cathode coupled to ground and an anode coupled to the anode of said third Schottky diode for clamping said logical high voltage level produced by said level shifting means in response to said second voltage to a predetermined voltage level.

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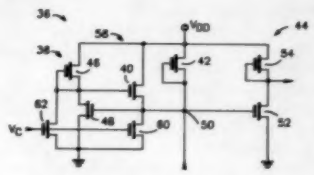
## 4,423,340
## SENSE AMPLIFIER

Brian M. Spinks, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 14, 1981, Ser. No. 330,350
Int. Cl.³ H03K 17/30, 17/687; G01R 19/165
U.S. Cl. 307—530 6 Claims




1. A sense amplifier comprising:
charging means for charging a node to a first predetermined voltage;
a transistor having a control electrode and a first electrode coupled to said node, and second electrode coupled to a second voltage which is different from said first voltage; and
detector means for providing an output signal when the voltage on said node exceeds a third predetermined voltage, the third voltage being intermediate said first and second voltages.

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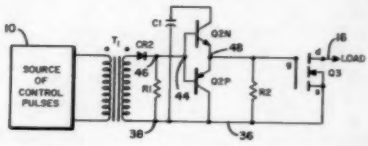
## 4,423,341
## FAST SWITCHING FIELD EFFECT TRANSISTOR DRIVER CIRCUIT

Randolph D. W. Shelly, Rosemere, Canada, assignor to Sperry Corporation, New York, N.Y.

Filed Jan. 2, 1981, Ser. No. 222,032
Int. Cl.³ H03K 17/687, 17/04
U.S. Cl. 307—570 6 Claims




1. An improved inverter power supply circuit of the type having transformer coupling means including at least primary winding means and secondary winding means, each having first and second terminals;
input means coupled to said first and second terminals of said primary winding means for coupling to sources of dc voltages;
input switching means coupled to one of said first and second terminals of said primary winding means and said input means for switching current through said primary winding means in response to switching control signals applied thereto, thereby producing an alternating voltage across said primary winding means and said secondary winding means;
field effect transistor power switching means having gate means for controlling switching of said field effect transistor means between current conductive operational states, and

non-current conductive operational states in response to signals applied to said gate means;

gate charging circuit means coupled intermediate said secondary winding means and said power switching means for rapidly charging said gate means for causing said field effect transistor means to be rapidly switched to the current conductive state in response to first ones of said control signals received by said input switching means;

gate discharging circuit means coupled intermediate said secondary winding means and said power switching means for rapidly discharging said gate means for causing said field effect transistor means to be rapidly switched to the non-current conductive state in response to second ones of said control signals received by said input switching means; and including

diode means coupled intermediate said secondary winding means and said gate means, for providing a path of current conduction to rapidly charge the capacitance of said gate means for speeding up the switching of said field effect transistor means to the current conductive state;

said gate charging circuit means further including charging switching transistor means coupled intermediate said secondary winding means and said gate means for rapidly charging the capacitance of said gate means when said charging transistor means is switched to the conductive state in response to said input switching means being switched to the current conductive state; wherein the improvement comprises:

capacitor means included in said gate charging circuit means, said capacitor means coupled to said charging switching transistor means for biasing said charging switching transistor means to the current conductive state.

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**4,423,342**

## STEPPING MICROMOTOR CAPABLE OF ROTATION IN BOTH SENSES

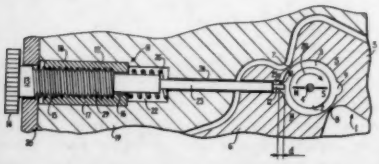
**Mohamed Mokdad, Bienne, Switzerland, assignor to Omega SA, Bienne, Switzerland**

**Filed Dec. 14, 1982, Ser. No. 449,806**

**Claims priority, application Switzerland, Dec. 18, 1981, 8108/81**

**Int. Cl.³ H02K *7/10***

**U.S. Cl. 310—41** **7 Claims**



1. Rotary stepping micromotor for timepiece use comprising a core of magnetic material, a winding on said core, a stator magnetically coupled to said core and having two pole pieces separated or integrally formed with one another, a magnetized rotor encircled by said pole pieces exhibiting at least one pair of diametrally opposed poles (N-S) a gap separating the pole pieces from the rotor and magneto-mechanical means arranged and adapted to reverse the rotation sense of said rotor wherein said means comprises a magnetic element capable of penetrating said gap in order to modify the stationary position angle of said rotor thereby to reverse the normal rotation sense when electric control pulses are applied to the winding.

**4,423,343**

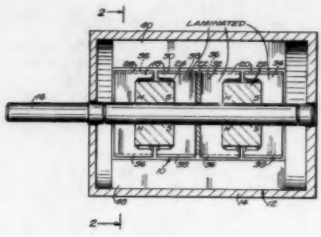
## SYNCHRONOUS MOTOR SYSTEM

**John H. Field, II, Medfield, Mass., assignor to Sigma Instruments, Inc., Braintree, Mass.**

**Filed Apr. 1, 1981, Ser. No. 249,821**

**Int. Cl.³ H02K *37/00***

**U.S. Cl. 310—49 R** **13 Claims**



1. A motor system comprising:

a stator and a rotor movable relative to each other about an axis,

said stator having a plurality of radially directed stator poles,

said poles having stator teeth arranged in a circle around the axis, said teeth on each pole having a given pitch, the pitch on one pole being the same as the pitch on every other pole,

said rotor having permanently magnetized teeth,

a coil on each of said stator poles, and

means for energizing the coils,

the number of poles on said stator being sixteen at regular intervals of twenty two and one-half mechanical degrees and each having a plurality of teeth offset from the teeth on the poles ninety degrees therefrom by one full pitch and offset from the teeth on adjacent poles by one-quarter pitch,

said stator poles each having a root toward the outer periphery of said stator and a crown at said teeth, said poles each being narrowed between said root and said crown,

said root and said crown having absolute dimensions along the tangential direction and the absolute dimension along the tangential direction of said root and said crown being substantially the same.

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**4,423,344**

## LIQUID COOLED EDDY CURRENT COUPLING HAVING ROTOR EXTENSION RING

**Thomas H. Jones, Wauwatosa, Wis., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.**

**Filed Feb. 23, 1981, Ser. No. 237,047**

**Int. Cl.³ H02K *9/197***

**U.S. Cl. 310—105** **6 Claims**

1. A liquid cooled eddy current coupling comprising:

a housing having rotatable input and output shafts;

a generally tubular inductor member mounted on one of said input and output shafts for rotation therewith;

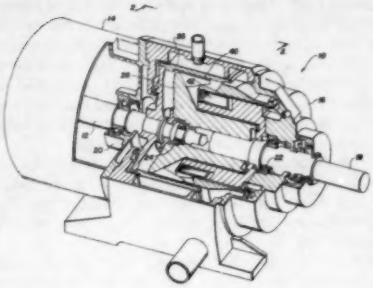
a magnetic rotor member mounted on the other of said input and output shafts for rotation therewith, said rotor member being located within said inductor member and having a plurality of poles aligned with said inductor member and separated therefrom by a circumferential air gap;

an annular field coil positioned with said rotor member, said field coil generating an encircling magnetic flux causing torque transmission between said inductor and rotor members and said input and output shafts;

a coolant inlet for supplying coolant to the interior of said housing along the exterior and above the midpoint of said inductor member;

said rotor member having a tubular extension extending from said aligned portions of said rotor member and in-

ductor member, said extension having an exterior circumferential groove therein forming a channel for receiving and discharging coolant from said inductor and rotor members where said channel is disposed on said extension



such that coolant is prevented from reaching said coil when said rotor is stationary; and

a coolant outlet for removing coolant from the interior of said housing.

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**4,423,345**

## MAGNETO FLYWHEEL ASSEMBLY

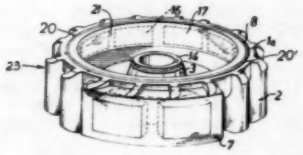
**Mats Nilsson, Åmål, Sweden, assignor to Aktiebolaget Svenska Elektromagneter, Åmål, Sweden**

**Filed Jan. 22, 1981, Ser. No. 227,470**

**Claims priority, application Sweden, Jan. 30, 1980, 8000746**

**Int. Cl.³ H02K 21/22**

**U.S. Cl. 310—153** **8 Claims**



1. A magneto flywheel assembly, comprising:

(a) a rotor having a cylindrical periphery of relatively soft material;

(b) a series of arcuate ceramic magnets fixed on said rotor and arranged in a circle and disposed along said cylindrical periphery, said magnets having a non-uniform radial thickness, said magnets having a first set of radial poles of alternating polarity directed radially away from said cylindrical periphery and arranged cylindrically, and a second set of opposite poles directed toward said cylindrical periphery, there thereby being a variation in spacing between said second set and said periphery; and

(c) a band of deflectable ferromagnetic metal harder than said soft material, and disposed between said magnets and said periphery, said band having a number of surface projections directed toward said periphery, said band having a thickness remote from said projections corresponding to the minimum size of said variation in spacing, and a thickness through said projections corresponding to the maximum size of said variation in spacing;

whereby said cylindrical periphery forces said band to deflect against said variably disposed second set of poles and permits certain of said projections to be radially received at least in part into the softer cylindrical periphery.

**4,423,346**

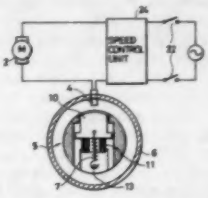
## SAFETY DEVICE FOR PREVENTING OVERSPEED

**Yuki Nakazawa, Katsuta, Japan, assignor to Hitachi Koki Company, Limited, Tokyo, Japan**

**Filed May 13, 1981, Ser. No. 263,240**

**Int. Cl.³ H02H 5/00**

**U.S. Cl. 310—68 E** **1 Claim**



1. A safety device for preventing overspeed for use with a device having a rotary shaft driven by an electric driving mechanism, comprising:

(a) a rotary member arranged to rotate with said rotary shaft;

(b) a feeding path through which electrical power is supplied to said electric driving mechanism, said feeding path being located in the vicinity of said rotary member;

(c) a cutter movably received in a radial bore formed in said rotary member so that said cutter is contactable with said feeding path when protruding outwardly in response to centrifugal force thereon;

(d) a tension spring having one end fixedly supported with respect to said rotary member, and another end connected to said cutter; and

(e) means for biasing said cutter against the tensile force of said tension spring, said means being received in said bore of said rotary member in such a manner that the position in the radial direction of said rotary member is adjustable, the means having a bore at its center so that said tension spring penetrates therethrough;

said outward protrusion of the cutter occurring when centrifugal force on the mass of the cutter exceeds the tensile force of the spring.

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**4,423,347**

## POSITIONING ELEMENT WITH A PIEZO-CERAMIC BODY

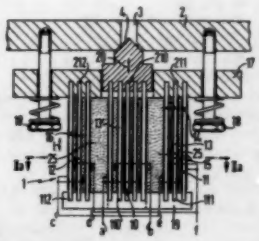
**Peter Kleinschmidt, Munich; Hans Meixner, Haar, and Valentin Magori, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Dec. 8, 1981, Ser. No. 328,618**

**Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048631**

**Int. Cl.³ H01V 7/00**

**U.S. Cl. 310—331** **17 Claims**



1. An electrically actuated positioning element system, com-

prising: a positioning element formed of two piezo-electrical bodies each formed of a plurality of lamellae provided with electrodes, said lamellae extending in a motion direction of the positioning element between ends of said piezo-electrical bodies; the lamellae being mechanically connected to one another with their principle surfaces parallel to the direction of motion so as to be immobile with respect to one another; a length of the lamellae between the ends of the bodies being at least 5 times as great as a thickness of the individual lamellae and the lamellae all having the same thickness; said piezo-electrical bodies being designed such that upon application of an electrical voltage with a field direction which promotes a polarization of the material of the lamellae, the body to which the electrical voltage is applied is shortened; the two piezo-electrical bodies having approximately a same length and being disposed next to one another; the two bodies being connected to one another at their one ends by a cross arm, and at their other ends one of the bodies having its end active and free to move relative to the end of the other body such that a resultant relative motion occurring between the two body ends not connected by the cross arm may be utilized; means for absorbing a lateral thrust of the bodies; and the two piezo-electrical bodies being electrically connected to one another for reverse phase operation wherein one contracts while the other is in a lengthened condition and vice versa.

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**4,423,348**

## COMBINED HIGH PRESSURE DISCHARGE LAMP AND REFLECTOR ASSEMBLY

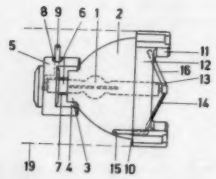
**Wolfgang Greiler, Unterhaching, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft für elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany**

**Filed Aug. 28, 1981, Ser. No. 297,359**

**Claims priority, application Fed. Rep. of Germany, Sep. 8, 1980, 3033688**

**Int. Cl.³ H01J *61/40*; F21V *7/20, 29/00***

**U.S. Cl. 313—113** **12 Claims**




1. A lamp assembly comprising:

a high pressure discharge lamp (1) having a first and a second end (6, 13);

a reflector (2) in which the lamp (1) is arranged with its longitudinal axis in the reflector axis, the reflector (2) having a neck (3) at one end and a light emission aperture (10) at the other end thereof;

a base (5) made of a temperature resistant electrically insulating material, and having connections to said first lamp end (6) and to the reflector neck (3);

an end ring (12) made of a temperature resistant, electrically insulating material, and having a connection to said reflector (2) at said light emission aperture (10);

support and connecting means (14, 14', 16) coupled between said second lamp end (13) and said end ring (12) for connecting said second lamp end (13) to said end ring (12) with said second lamp end (13) facing said light emission aperture (10) of said reflector (2);

said base (5) and said end ring (12) having shoulders and recesses and said connections between said lamp and said base and end ring defining free vent openings for passage of cooling air;

a pair of electrical connection members (9, 15) each respectively associated with said base and with said end ring;

said electrical connection member (9) of at least said base being external of said reflector (2); and

said support and connecting means coupling said second lamp end (13) to said end ring (12) comprising a lead-in wire (14) of said lamp which extends from said second lamp end (13) substantially radially of said light emission aperture to at least one of said reflector (2) and end ring (12), said lead-in wire being connected to said connection member (15) associated with said end ring (12) to electrically interconnect said second lamp end (13) to said connection member (15) associated with said end ring; and a support member (16) connected to support said second lamp end (13) relative to said end ring (12);

said electrical connection members (9, 15) being formed of rigid materials and being rigidly connected to said base (5) and to said end ring (12), respectively, in order to increase the mechanical integrity and electrical security of the assembly; and

said lead-in wire (14) extending along a substantially straight line from said second lamp end (13) directly to said end ring (12), said support member (16) supporting said second lamp end (13) relative to said end ring (12) and retaining said second lamp end (13) in position relative to said end ring (12), and said lead-in wire (14) being connected directly to said connection member (15) associated with said end ring (12).

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**4,423,349**

## GREEN FLUORESCENCE-EMITTING MATERIAL AND A FLUORESCENT LAMP PROVIDED THEREWITH

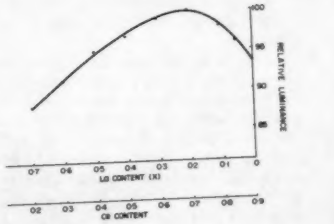
**Shigeharu Nakajima; Keiji Ichinomiya; Koichi Okada; Kaname Tsuchikura, and Minoru Kashiwagi, all of Anan, Japan, assignors to Nichia Denshi Kagaku Co., Ltd., Anan, Japan**

**Filed Jul. 1, 1981, Ser. No. 279,561**

**Claims priority, application Japan, Jul. 16, 1980, 55-97769; Aug. 22, 1980, 55-116220**

**Int. Cl.³ H01J *1/63, 63/04***

**U.S. Cl. 313—487** **11 Claims**




1. A green light-emitting fluorescent material prepared from terbium activated lanthanum cerium orthophosphate and expressed by formula (I):

$$La_xTb_yCe_zPO_4 \quad (I)$$

where:

$x+y+z=1$

$0.05<x<0.35$

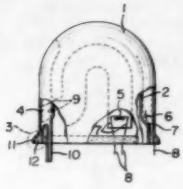
$0.05<y<0.3$

$0.6<z<0.9$.

## 4,423,350
## FLUORESCENT LAMP AND PROCESS FOR FABRICATING THE SAME

Yoshiro Ogata, Ibaraki; Haruo Yamazaki, Moriyama, and Hidezoh Akutsu, Kobe, all of Japan, assignors to Matushita Electronics Corporation, Osaka, Japan

Filed May 14, 1981, Ser. No. 263,575
Claims priority, application Japan, May 14, 1980, 55-64510
Int. Cl.³ H01J 63/04, 9/00
U.S. Cl. 313—493 8 Claims



1. A fluorescent lamp of the type in which a lamp envelop comprises:

an outer bulb having generally a spherical or a partially spherical or a cylindrical configuration and an inner bulb inserted into said outer bulb in predetermined nested relationship, said bulbs having adjacent end portions with an opening therebetween;

either the inner surface of said outer bulb or the outer surface of said inner bulb being formed with a groove which defines a discharge path between said outer and inner bulbs;

a phosphor formed at least over the wall surfaces of said groove formed on either of the inner surface of the outer bulb or the outer surface of the inner bulb;

an electrode disposed at each end of said discharge groove; and

a radiation emitting discharge gas consisting of mercury gas vapor and a rare gas vapor and a rare gas or a rare gas mixture filled in said discharge groove,

wherein

the end portion of at least one of said bulbs is flared away from the adjacent end portion of the other bulb to form an annular space, so that glass frit can be filled in said annular space, whereby the adjacent end portions of said outer and inner bulbs can be gas-tightly sealed together and lead-wires which also serve to support the electrodes at the ends of said discharge path and are extended through said annular space between the adjacent end portions of said outer and inner bulbs can also be gas-tightly sealed with said glass frit when the latter is heated and then solidified.

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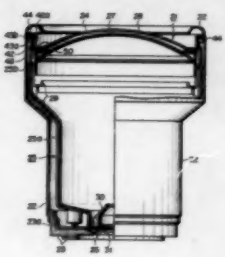
## 4,423,351
## VACUUM CONTAINER OF RADIATION IMAGE MULTIPLIER TUBE AND METHOD OF MANUFACTURING THE SAME

Fumio Sugimori, Yokohama; Chikae Nishino, Sagamihara, and Norio Harao, Ayase, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 4, 1981, Ser. No. 260,399
Claims priority, application Japan, May 6, 1980, 55-59710; May 29, 1980, 55-70760
Int. Cl.³ H01J 31/26, 40/00
U.S. Cl. 313—523 8 Claims

1. A vacuum container of a radiation image multiplier tube comprising a cylindrical body, a radiation input window of Al or an Al alloy provided at one end of the body, an insulation member of glass or ceramic provided at the other end of the body with a portion thereof being employed as an output portion for outputting radiation image multiplied signals, said container including a first ring made of Fe or an Fe alloy constituting a portion of the cylindrical body airtightly connected between the peripheral portion of the radiation input window and the insulator member, and a hot pressure-bonded airtight junction between the first ring and the input window having one or more thin layers of at least one metal selected



from the group consisting of Ni, Cu and Al, interposed therebetween in such a manner that the peripheral portion of the radiation input window is compressed and caused to be substantially thinner than its initial thickness by the hot pressure bonding.

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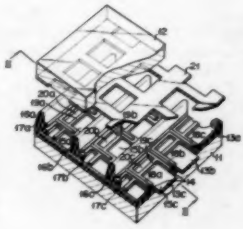
## 4,423,352
## PANEL TYPE DISPLAY APPARATUS

Toshikiyo Miyazaki, Saga; Ushio Miura, Kawasaki, and Masahiro Hatanaka, Tokyo, all of Japan, assignors to Mitani Electronics Industry Corp., Fuchu, Japan

Filed Jul. 2, 1981, Ser. No. 279,756
Int. Cl.³ H01J 17/49
U.S. Cl. 313—584 3 Claims



1. A panel type display apparatus comprising:

a transparent front plate;

a back plate facing said front plate at a small distance;

said front plate sealed to the back plate and containing a discharge gas therein;

a plurality of parallel strip-like cathodes formed on the inner surface of said back plate facing said front plate and extending in a first direction;

an insulating rib structure formed on the inner surface of said back plate and having a lattice-like structure extending along lines between adjacent cathodes in said first direction and also along lines extending in a second direction at right angles to said first direction;

a plurality of partitioning ribs raised from at least portions of said insulating rib structure extending in said second direction and in contact with said front plate;

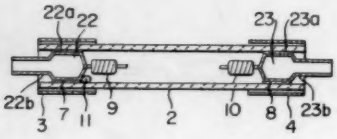
a plurality of anodes formed to extend along one side of said partitioning ribs; and

seed discharge sections each defined in a portion of the cathode surface in each said display element section in the vicinity of the corresponding anode.

## 4,423,353
## HIGH-PRESSURE SODIUM LAMP

Yoshiro Ogata, Ibaraki; Haruo Yamazaki, Moriyama; Takashi Ikeda, Takatsuki, and Hidezoh Akutsu, Kobe, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Jun. 10, 1981, Ser. No. 272,178
Claims priority, application Japan, Jun. 17, 1980, 55-82645; Oct. 3, 1980, 55-138969; Jan. 19, 1981, 56-6924
Int. Cl.³ H01J 61/30, 61/36, 61/073, 61/22
U.S. Cl. 313—631 3 Claims

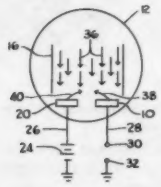



1. A high-pressure sodium lamp comprising an outer envelope, an arc tube made of transparent alumina containing sodium and supported within the outer envelope, and means for supplying electrical energy to said arc tube through feed throughs, the improvement which comprises: a single crystal alumina arc tube having cylindrical ends sealed with feedthroughs each having an electrode extending into the arc tube from the inner end thereof, each of said feed-throughs comprises an enlarged-diameter portion having a cylindrical outer wall sealed to the inner cylindrical wall surface of said arc tube and a reduced-diameter portion contiguous and concentric with said enlarged-diameter portion and defining an external annular space between the inner cylindrical wall surface of said arc tube and said feed-through.

## 4,423,354
## METHOD AND APPARATUS FOR CONTROLLING ELECTRODE VOLTAGE IN ELECTRON BEAM TUBES

Thomas D. Kegelman, Ridgefield, Conn., assignor to KCR Technology, Inc., East Hartford, Conn.

Filed Dec. 24, 1980, Ser. No. 219,971
Int. Cl.³ H01J 29/41
U.S. Cl. 315—12 R 25 Claims




1. A method of controlling the voltage on an electrode in an electronic tube device of the electron beam type comprising the steps of:

(a) providing a controlling electrode in physical proximity to the electrode to be controlled and positioning said controlling electrode so that said controlled and controlling electrodes are scanned substantially simultaneously by the tube electron beam;

(b) applying a control voltage of predetermined magnitude and polarity to said controlling electrode;

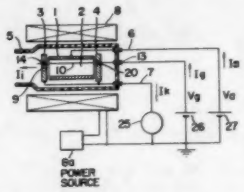
(c) scanning said controlled and controlling electrodes substantially simultaneously to provide primary and secondary electrons in the region of said electrodes; and

(d) the magnitudes and polarity of the control voltage being selected to cause an exchange of electrons between said controlled and controlling electrodes during the period of electron bombardment causing the voltage on said controlled electrode to switch to a desired value.

## 4,423,355
## ION GENERATING APPARATUS

Katsuhiro Kageyama, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Mar. 19, 1981, Ser. No. 245,534
Claims priority, application Japan, Mar. 26, 1980, 55-37572; Jul. 25, 1980, 55-102216; Jul. 25, 1980, 55-102217; Oct. 9, 1980, 55-141364; Oct. 28, 1980, 55-151016; Nov. 19, 1980, 55-162856; Nov. 19, 1980, 55-162857
Int. Cl.³ H01J 33/00
U.S. Cl. 315—111.81 30 Claims




1. In an ion generating apparatus of the type comprising a cylindrical vacuum envelope, an anode disposed in said vacuum envelope and provided with a tubular inner hollow portion, a pair of cathodes disposed in said vacuum envelope near both end openings of said anode so as to cover said end openings, means for applying a voltage between said anode and said cathode to creat an electric field in said hollow portion, means for creating a magnetic field in said hollow portion in a direction parallel to a central axis of said hollow portion, means for supplying working gas into said hollow portion to establish a cross field discharge, and an evacuating device for creating a predetermined vacuum condition in said vacuum envelope, at least one of said cathodes being provided with a through hole at a central portion thereof, the improvement in which a control electrode is stretched in said hollow portion in parallel spaced relation with respect to the central axis of said hollow portion.

## 4,423,356
## SELF-SHIFT TYPE GAS DISCHARGE PANEL

Sei Sato, Akashi; Masayuki Wakitani, Hyogo; Kenichi Oki, Takarazuka; Shoshin Miura, Kobe; Hisashi Yamaguchi, Hyogo; Yoshinori Miyashita, Himeji; Tsutae Shinoda, Akashi; Kazuo Yoshikawa, Kobe; Kurahashi Keizo, Kobe, and Toyoshi Kawada, Kobe, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 28, 1982, Ser. No. 383,143
Claims priority, application Japan, Jun. 23, 1981, 56-97745
Int. Cl.³ H01J 65/00; H05B 41/00
U.S. Cl. 315—169.2 15 Claims

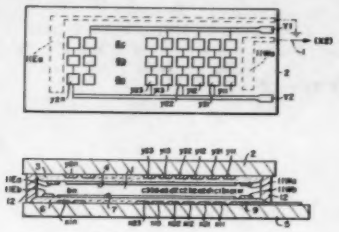
1. A self-shift type gas discharge panel comprising:

at least one shift channel comprising a regular arrangement of a plurality of shift discharge cells defined between opposing portions of shift electrodes on a pair of substrates separated by a gas discharge space, the shift electrodes being covered with a dielectric layer for charge accumulation and sequentially and regularly connected by respective shift electrode connections to a plurality of buses for providing shift voltages,

a corresponding write discharge cell defined between a portion of one of said shift electrodes on one of said substrates and a write electrode located on the other one of said substrates, at one end of each said shift channel, each write electrode being connected to a corresponding write

voltage terminal and covered with said dielectric layer, and

at least one charge leak conductive layer provided on at least one of said substrates adjacent at least to the discharge



cells at both ends of each said shift channel, said at least one charge leak conductive layer having a configuration for dissipating abnormal charges caused by the operation of said panel.

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**4,423,357**

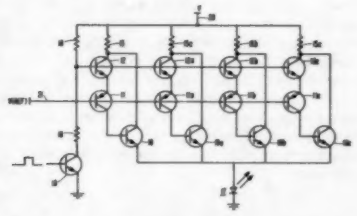
**SWITCHABLE PRECISION CURRENT SOURCE**

**Jeffery A. Engelman, Longmont, and James L. Sanford, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 21, 1982, Ser. No. 390,590**

**Int. Cl.³ H03K *17/60***

**U.S. Cl. 315—307** **7 Claims**



1. A switchable current source comprising:

a load;

power source means for supplying current;

a reference voltage source means;

a switching signal source means;

first transistor means coupled between said power source means and said load, having a collector means and an emitter means coupled thereto, respectively;

second and third transistor means coupled together in series to conduct in the same direction between said power source means to a base means of said first transistor;

means for coupling said reference voltage source means to a base means of said third transistor for regulating the current therethrough; and

means for coupling said switching signal source means to a base means of said second transistor means for controlling the current therethrough.

**4,423,358**

**HORIZONTAL DEFLECTION CIRCUIT WITH LINEARITY CORRECTION**

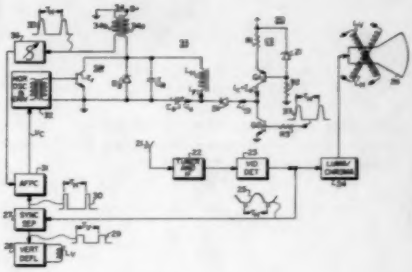
**Willem den Hollander, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.**

**Filed May 28, 1982, Ser. No. 383,055**

**Claims priority, application United Kingdom, Apr. 23, 1982, 8211832**

**Int. Cl.³ H01J *29/56***

**U.S. Cl. 315—371** **7 Claims**



1. In a television display system having a cathode ray tube and a deflection yoke associated therewith to generate by means of raster scanning a picture display from the information contained in a composite video signal, a deflection circuit with linearity correction, comprising:

a deflection winding;

a trace switch that is periodically switched by a deflection rate signal synchronized with said composite video signal to generate raster scanning current in said deflection winding during a deflection cycle, wherein losses incurred during a deflection cycle tend to change said scanning current to one that would introduce asymmetrical linearity distortion to said picture display;

a source of retrace pulse voltage;

a source of correction current including an inductance; and

switching means including a first rectifier that periodically couples said inductance to said deflection winding during the trace interval of said deflection cycle to conduct current from said inductance to said deflection winding and a second rectifier coupled to said inductance and to said source of retrace pulse voltage to conduct current from said inductance to said retrace pulse voltage source during the retrace interval of said deflection cycle to develop in said scanning current a DC component that flows in a direction that corrects for the introduction of said asymmetrical linearity distortion.

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**4,423,359**

**ELECTRIC MOTOR**

**Koosuke Hashimoto, Moriguchi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed May 1, 1981, Ser. No. 259,611**

**Claims priority, application Japan, May 13, 1980, 55-63493; Jul. 31, 1980, 55-105269; Aug. 13, 1980, 55-111442; Feb. 2, 1981, 56-16033; Feb. 2, 1981, 56-16034**

**Int. Cl.³ B65H *59/38***

**U.S. Cl. 318—6** **22 Claims**

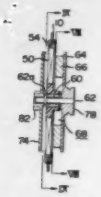
1. An electric motor comprising:

disk-shaped first rotor means mounted for rotation about an axis, said first rotor means including a magnet;

coil means, arranged generally in a plane extending transverse to said axis and axially confronting said magnet, for generating a rotary magnetic field to rotate said first rotor means, thereby to produce a driving force;

disk-shaped second rotor means, mounted for rotation about

said axis at an axial side of said coil means opposite from said first rotor means, for forming a magnetic circuit for a magnetic field generated by said magnet, such that said second rotor means is rotatable about said axis independently of said first rotor means; and



connecting means for releasably mechanically connecting said first and second rotor means, such that the rotations thereof are joined.

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**4,423,360**

## DEVICE FOR CONTROLLING THE SYNCHRONISM OF TWO MOTORS

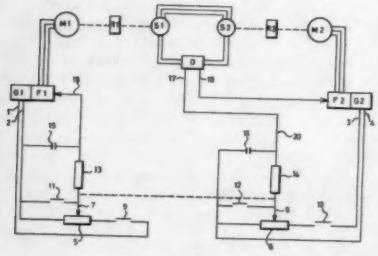
**Klaas Pasterkamp, Huizen, Netherlands, assignor to Moba Holding Barneveld B.V., Barneveld, Netherlands**

**Filed Apr. 21, 1982, Ser. No. 370,528**

**Claims priority, application Netherlands, Apr. 28, 1981, 8102072**

**Int. Cl.³ H02P *5/50***

**U.S. Cl. 318—85** **5 Claims**



1. Synchronizing system for two electric motors each having a feed control means in which a control signal is deduced from the positional difference of both motors by means of a comparator means and this signal is fed to the feed control means of at least one motor in which the motors are asynchronous rotary field motors the output of each motor being connected to a reduction gear the output of each reduction gear being mechanically connected to the rotor of a synchronizer having a rotor and stator, the stators of said synchronizers being connected to a discriminator for generating an output signal, the feed control means of each motor comprising a frequency converter controlled by an input signal, and the said output signal being combined with the input signal of at least one of said frequency converters in such a way that the positional difference of the motors is counteracted.

**4,423,361**

## MECHANICAL DRIVE APPARATUS FOR PROVIDING LINEAR MOTION IN RESPONSE TO ELECTRICAL DRIVE SIGNALS

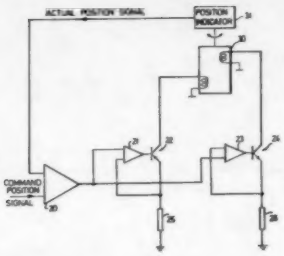
**Sven G. V. Stenudd, and Lars-Gunnar M. Stenudd, both of Lidingö, Sweden, assignors to Facit Aktiebolag, Atvidaberg, Sweden**

**Filed Feb. 23, 1981, Ser. No. 237,034**

**Claims priority, application Sweden, Feb. 27, 1980, 8001511**

**Int. Cl.³ G05B *11/00***

**U.S. Cl. 318—135** **16 Claims**




1. A drive apparatus comprising:

yoke means for forming first and second magnetic gaps, each having a magnetic flux supplied by first and second stator windings;

a moveable magnetic member having first and second portions disposed in said first and second magnetic gaps, and moveable with respect to said magnetic gaps; said first and second portions having complementary surface areas whereby one increases in size with respect to its respective gap upon motion thereof, and the remainder simultaneously decreases in size with respect to its respective gap;

means for supplying complementary electric driving currents to each of said stator windings, one of said currents having a magnitude which increases with increases in an input signal and the remaining of said currents having a magnitude which decreases with increases in said input signal, said currents related whereby when one of said currents is zero, the remaining current has a predetermined magnitude, whereby opposite acting forces are exerted on first and second portions of said moveable member, each of said magnetic gaps in response to a respective stator winding current produce a force which changes quadratically with said current, the sum of said forces produced by said gaps providing a linear movement between said yoke means and said moveable magnetic member.

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**4,423,362**

## ELECTRIC VEHICLE CURRENT REGULATING SYSTEM

**Charles E. Konrad, Roanoke, Va., and Robert C. Clark, deceased, late of Roanoke, Va. (by Jean B. Clark, executrix), assignors to General Electric Company, Salem, Va.**

**Filed May 19, 1982, Ser. No. 379,867**

**Int. Cl.³ H02P *5/10***

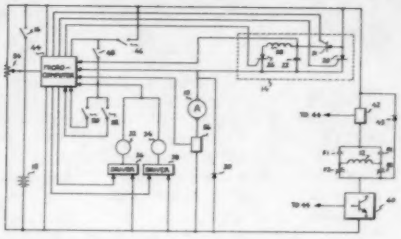
**U.S. Cl. 318—139** **9 Claims**

1. In a control system for a vehicle having an electric traction motor for providing vehicle propulsion power, the control system including a percent conduction time power regulator responsive to a current reference signal to regulate motor current and also including an accelerator for producing a current command signal having a value corresponding to an operator desired value of said current reference signal, the improvement comprising:

(a) means for establishing a first current limit value which varies between a maximum and a minimum value inversely with the percent conduction time of said regulator;

(b) means for establishing a second current limit value which varies between a maximum and a minimum value as an inverse function of the time that the motor current is maintained at the lesser of said first current limit value or such second current limit value;

(c) means for comparing the current command signal value to the first and second current limit values and for producing said current reference value such that it acquires a



value representative of the lesser of said current command signal value, said first current limit value, or said second current limit value; and

(d) means for applying the current reference value to control the percent conduction time of the power regulator in a manner to minimize any difference between actual motor current magnitude and the magnitude of motor current corresponding to the acquired value of said current reference.

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**4,423,363**

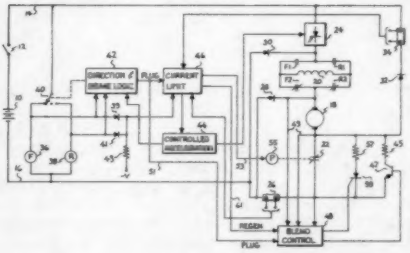
**ELECTRICAL BRAKING TRANSITIONING CONTROL**

**Robert C. Clark; Joe C. Lambert, both of Charlottesville, and Sherrill G. Thomas, Trevilians, all of Va., assignors to General Electric Company, Salem, Va.**

**Filed Jul. 27, 1981, Ser. No. 288,083**

**Int. Cl.³ H02P 3/12**

**U.S. Cl. 318—375** **6 Claims**



1. An improved electrical brake blending apparatus for a direct current electric motor power system, the motor having first and second power terminals and including a field winding and an armature, the system including a DC power source connected between a first and second power bus, power contacts for connecting the first terminal of the motor to the first power bus, power regulating means for connecting the second motor terminal to the second power bus, unidirectional conducting means connected between the first terminal of the motor and the second power bus and means for initiating electrical braking of the motor by reversing the relative polarity of the motor field winding and armature and opening the power contacts while the armature is rotating, the improvement comprising:

(a) a first relatively low ohmic value resistance;

(b) first switching means, said switching means and said resistance being connected in a series circuit path in parallel with the contacts;

(c) means for momentarily actuating said first switching means upon initial opening of the contacts whereby an alternate current path between said motor and said power supply is provided in order to establish a desired polarity of flux in the motor to enable electrical braking;

(d) a second relatively low ohmic value resistance;

(e) a second switching means;

(f) means for connecting said second resistance and said second switching means in a series circuit path in parallel with the contacts;

(g) means for closing the contacts during electrical braking for converting said system from regenerative to plug braking; and,

(h) means for actuating said second switch means immediately prior to closing the contacts to thereby provide an alternate armature current path to enable relatively smooth transitioning from regenerative to plug braking.

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**4,423,364**

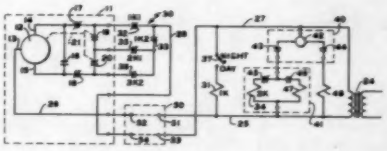
**ELECTRIC MOTOR DAMPER DRIVE WITH BACKUP POWER PACK**

**Arlon D. Kompelien, Richfield, and Curtis E. Westley, St. Louis Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Mar. 29, 1982, Ser. No. 362,590**

**Int. Cl.³ H02P 7/18**

**U.S. Cl. 318—440** **17 Claims**



1. A condition responsive control system adapted to control condition changing means, comprising:

an air duct for admitting outside air to an air conditioned space;

a reversible electric motor operable in first and second opposite directions in response to electrical energization;

a damper in said air duct actuated by said reversible electric motor for controlling the amount of air admitted through said duct;

a control circuit responsive to a sensed environmental condition in the air conditioned space for selectively supplying electrical power from a primary source to energize said reversible electric motor for operation in the first or second directions depending on the sensed condition; and

backup power pack means responsive to the absence of power from the primary power source to supply electrical energization to said reversible electric motor to drive said motor only in the first direction.

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**4,423,365**

**SERVO CONTROL CIRCUIT**

**James A. Turner, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.**

**Filed Nov. 9, 1981, Ser. No. 319,859**

**Int. Cl.³ G05B 13/00**

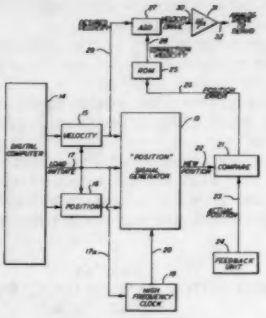
**U.S. Cl. 318—561** **9 Claims**

1. In a simulator training apparatus having a plurality of operations controlled in response to digital information from a computer and at least some of said operations having moveable parts connected for movement by an analog servo motor device, a digital control circuit to actuate said analog servo

motor device in response to said digital information, comprising:

means to receive digital information from said digital computer indicative of a new servo position at a predetermined velocity rate,

said digital information being pre-timed to correspond with a pre-selected timing rate,



position signal generator means responsive to said pre-timed digital information to generate a predetermined number of position signals intermediate said pre-timed digital information, and

Read-Only-Memory means to produce a correction velocity signal responsive to position signal information input,

said digital control circuit being so constructed and arranged that said servo motor device is moved smoothly from an actual present position to said new servo position.

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**4,423,366**

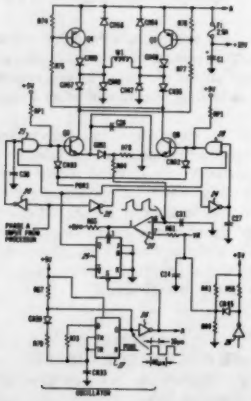
## MOTOR DRIVE

**Johannes F. Gottwald, Park Ridge, Ill., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Aug. 13, 1981, Ser. No. 292,754**

**Int. Cl.³ H02K *29/04***

**U.S. Cl. 318—696** **8 Claims**



1. A controller for driving a stepper motor winding comprising:

first, second, third and fourth transistors,

first, second, third and fourth diodes, said first and second diodes connected in series between said first and second transistors, said third and fourth diodes connected in series between said third and fourth transistors, said winding connected between the junction of said first and second diode and the junction between the junction of said first and second diode and the junction between said third and fourth diode,

a resistor connecting said second and fourth transistors to ground,

means for coupling said transistors so that either said first and fourth or said second and third transistors can be turned on at any point in time, and

chopper means responsive to the voltage across said resistor for iteratively cutting off said transistors to limit the winding current.

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**4,423,367**

## DEVICE FOR DETERMINING THE PARAMETER VALUES FOR STATOR RESISTANCE, PRINCIPAL INDUCTANCE AND LEAKAGE INDUCTANCE OF AN ASYNCHRONOUS MACHINE

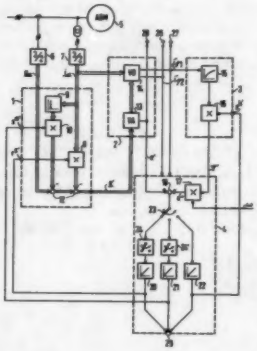
**Felix Blaschke, and Leonhard Reng, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens AG, Munich, Fed. Rep. of Germany**

**Filed Sep. 8, 1981, Ser. No. 299,780**

**Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034275**

**Int. Cl.³ H02P *5/40***

**U.S. Cl. 318—803** **20 Claims**



1. Apparatus for determining the actual value of at least one of the stator resistance, the main inductance and the stray inductance parameters of an asynchronous machine having associated operating stator current and stator voltage vectors, from preset values of said parameters, comprising

an EMF-forming circuit coupled to receive signals from said machine corresponding to said stator vectors and designed to develop a first vector signal representative of the EMF and the flux of the machine based on said stator vector signals and said preset values of said stator resistance and said stray inductance parameters;

an arithmetic control circuit coupled to receive said signals from said machine, coupled to receive said first vector signal, designed to develop a control signal representative of a component of the magnetization current of said machine correlative of said preset values, and also designed to develop a derivative signal characteristic of the first vector signal;

an arithmetic model circuit for simulating magnetic field development by the machine, coupled to receive said control signal and designed to develop a model flux signal characteristic of the machine flux correlated to said preset value of said main inductance parameter; and

a control circuit coupled to receive said model flux signal and said derivative signal characteristic of the first vector signal, and providing a comparable signal characteristic of a second vector, said second vector being representative

of an EMF or a flux based on said model flux signal, and comprising a balancing circuit for readjusting the values of said parameters until a balanced condition exists between said derivative signal and said comparable signal.

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**4,423,368**

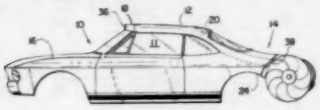
## TURBINE AIR BATTERY CHARGER & POWER UNIT

**Jean L. Bussiere, 27 E. Bluefield Dr., Manchester, Conn. 06040**

**Filed Nov. 17, 1980, Ser. No. 140,308**

**Int. Cl.³ B60K *1/00***

**U.S. Cl. 322—35** **4 Claims**



1. An automobile provided with an electric power generating system comprising:

an automobile body including a passenger compartment, a roof section, two sides and a rear section having two fender wells, one of the wells being adjacent one side of the body and the other of the wells being adjacent the other side of the body, each well defining an opening leading to the exterior of the body, the roof having a forwardmost portion situated forward of the rear section;

an air duct extending along the roof section for carrying a flow of air, the duct defining an air inlet located in the forwardmost portion of the roof section and generally facing forward of the automobile to receive air from natural wind and wind dynamically produced by movement of the automobile body through the air, and the duct being divided into two sections rearwardly of the inlet, each section received within and defining an air outlet in each fender well;

electrically generating means supported in the automobile; and

two air turbines each having multiple blades connected in driving relationship to the electricity generating means, one of the turbines being mounted in one fender well of the rear section with a portion of the turbine blades positioned at the air outlet in the one fender well, the other of the turbines being mounted in the other fender well with a portion of the turbine blades positioned at the air outlet in the other fender well whereby the generating means is activated by air currents flowing through the duct and impinging upon the turbine blades.

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**4,423,369**

## INTEGRATED VOLTAGE SUPPLY

**Allan A. Alaspa, and Robert R. Beutler, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

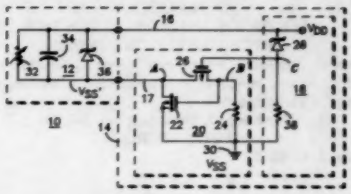
**Continuation of Ser. No. 757,169, Jan. 6, 1977, abandoned, which is a continuation of Ser. No. 577,818, May 15, 1975, abandoned. This application Apr. 11, 1979, Ser. No. 28,948**

**Int. Cl.³ G05F *5/00***

**U.S. Cl. 323—303** **3 Claims**

1. An integrated voltage supply coupled to a first and a second voltage terminal and providing a first and a second output, comprising:

A zener diode having an anode and a cathode, the cathode being coupled to the first voltage terminal; a first resistor coupled between the anode of the zener diode and the second voltage terminal, and forming a node between the first resistor and the anode of the zener diode; a first field effect transistor having a first and a second electrode and a gate electrode, the gate electrode being coupled to the node; a second resistor coupled between the first electrode of the first field effect transistor and the second voltage terminal; and a second field effect transistor having a first and a second electrode and a gate electrode, the gate electrode being coupled to the first electrode of the first field effect transistor, the first electrode of the second field effect transistor being coupled to the second voltage ter-



minal, the second electrodes of the first and second field effect transistors being coupled together and forming the second output, and the first voltage terminal also serving as the first output.

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**4,423,370**

## CIRCUIT CONFIGURATION FOR GENERATING A D-C OUTPUT VOLTAGE INDEPENDENT OF FLUCTUATIONS OF A D-C SUPPLY VOLTAGE

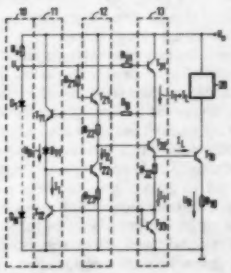
**Wilhelm Wilhelm, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany**

**Filed Sep. 8, 1982, Ser. No. 416,060**

**Claims priority, application Fed. Rep. of Germany, Sep. 21, 1981, 3137451**

**Int. Cl.³ G05F *3/20***

**U.S. Cl. 323—315** **6 Claims**



1. Circuit for generating a d-c output voltage being independent of fluctuations of a d-c supply voltage, comprising a reference voltage circuit connected to a d-c supply voltage source, said reference voltage circuit including a series circuit of a constant-current source and a potential shift branch, an inverting amplifier being connected to and addressed by said reference voltage circuit, said inverting amplifier having an output circuit including a combination of a plurality of first resistors and at least one first transistor determining the gain of said inverting amplifier, an output driver supplying said d-c output voltage, said output driver being connected to and addressed by said inverting amplifier and said output driver having an output circuit being connected to said potential shift branch of said reference voltage circuit for driving said potential shift branch, said output driver including an emitter follower stage having an output circuit with a second transistor and a second resistor, a voltage stabilizing circuit having a tap carrying a prestabilized voltage and said voltage stabilizing circuit being connected to the d-c supply voltage source, a third resistor connected between said tap and said at least one first transistor in said output circuit of said inverting amplifier,

and a fourth resistor connected between said tap and said second transistor in said emitter follower output circuit of said output driver, said first, second, third and fourth resistors having the same resistance value.

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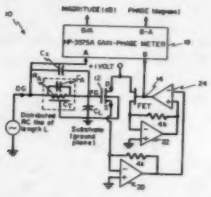
**4,423,371**

## METHODS AND APPARATUS FOR MICRODIELECTROMETRY

**Stephen D. Senturia, Boston, and Steven L. Garverick, Acton, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.**

**Filed Sep. 3, 1981, Ser. No. 299,264**
**Int. Cl.³ G01R *27/02***
**U.S. Cl. 324—61 R** **2 Claims**



1. A measuring device for measuring the impedance of a material, the device comprising:

(a) a measuring transistor comprising:

i. a semiconductor substrate, having formed therein a source region and a drain region, the source and drain regions being situated in the substrate such that a sensitive channel region separates them from each other;

ii. a gate insulator situated above the sensitive channel region of the substrate

iii. a first driven gate situated far enough remote from the channel region so that charge thereon does not directly affect the channel region; and

iv. a second, floating gate having a plurality of electrically conductive fingers proximate to, but spaced apart from, the first driven gate such that the material under measurement may fill the spaces therebetween, the floating gate being situated so that at least a portion of its electrically conductive area is situated above the gate insulator and sensitive channel region, whereby when a signal is applied to driven gate, the response of the floating gate in permitting current to flow in the channel will be dependent on the impedance of the material, and

(b) a conventional field effect transistor of substantially identical channel dimensions and substrate composition as the measuring transistor, the two transistors being connected in differential configuration and arranged such that their drain currents are constrainted to be equal,

(c) means to introduce a time-varying voltage on the driven gate of the measuring transistor, and

(d) means to determine the impedence of the material by comparing the introduced voltage and the gate voltage of the conventional transistor.

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**4,423,372**

## INSTRUMENT FOR MONITORING THE RADIATION HAZARD ARISING FROM ELECTRIC AND/OR MAGNETIC RADIO-FREQUENCY FIELDS

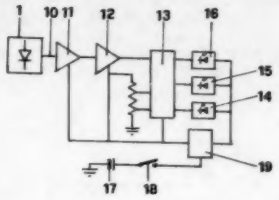
**Marco Bini, Pistoia; Amleto Ignesti, Florence; Luigi Millanta, Florence; Nicola Rubino, Florence, and Riccardo Vanni, Florence, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy**

**Filed Apr. 2, 1981, Ser. No. 250,212**
**Claims priority, application Italy, Apr. 3, 1980, 9397 A/80**
**Int. Cl.³ G01R *31/02***
**U.S. Cl. 324—72** **8 Claims**

1. An instrument for signalling the presence of an electric and/or magnetic radiofrequency field in excess of preset levels, comprising:

a field probe responsive to an electric and/or magnetic field;

said field probe including a plurality of field sensors electrically interconnected to provide an output of said field probe, the magnitude of which is a function of the magnitude of the sensed field;



a comparator means for comparing said output of said field probe with preset reference values comprising first and second values and providing a plurality of output signals as a function of said comparisons; and

a plurality of output indicators activated mutually exclusively by said output signals from said comparator to provide an indication indicative of the field sensed by said field probe being below a first value, between said first and a second value, or above said second value.

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**4,423,373**

## TEST PROBE

**Walter O. LeCroy, Jr., Piermont, N.Y., assignor to LeCroy Research Systems Corporation, Spring Valley, N.Y.**

**Filed Mar. 16, 1981, Ser. No. 243,993**
**Int. Cl.³ G01R *31/02***
**U.S. Cl. 324—72.5** **4 Claims**

1. A test probe comprising only two substantially rigid electrically conducting members terminating in respective spaced apart contact portions, which contact portions, when said test probe is in use, simultaneously contact spaced apart areas of a current conducting segment, said two electrically conducting members being electrically insulated from each other and being formed of two fixed opposite, electrically isolated, longitudinal portions of a cylindrical shaft, said opposite longitudinal portions being in face-to-face relationship and separated from each other by a layer of insulating material sandwiched therebetween, and said contact portions being formed of a conically shaped tip of said cylindrical shaft having a contact surface for contacting said current conducting segment, said conically shaped tip being longitudinally separated by said sandwiched layer of insulating material into respective, opposite portions; and insulated handle coupled to said cylindrical shaft at an end portion thereof remote from said conically shaped tip for enabling an operator of said test probe to hold said probe in one hand with both portions of said conically

shaped tip in contact with said current conducting segment; and first and second conducting leads electrically connected to respective ones of said opposite portions of said cylindrical shaft to selectively supply signals to and receive signals from said opposite portions of said cylindrical shaft.

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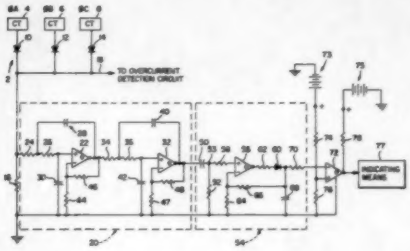
**4,423,374**

## UNBALANCED CURRENT DETECTOR FOR THREE PHASE ELECTRICAL SYSTEM

**Charles M. Hansen, Jr., Tinton Falls, N.J., assignor to The Bendix Corporation, Teterboro, N.J.**

**Filed Sep. 21, 1981, Ser. No. 303,738**
**Int. Cl.³ G01R *25/00***
**U.S. Cl. 324—86** **9 Claims**




1. For use with a three phase electrical system of the type including a current transformer for each of the three phases, means for rectifying the outputs of the current transformers and a resistor connected to the rectifying means for performing a current vector addition, with a ripple voltage having a particular harmonic content developed across the resistor, apparatus for detecting an unbalanced phase current condition comprising:

means responsive to the ripple voltage for passing the highest value of a selected harmonic of the system nominal frequency without significant attenuation; and

means connected to the filter means for detecting when the nominal system harmonics exceed a predetermined threshold commensurate with the unbalanced phase current condition.

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**4,423,375**

## SELF-ALIGNED LIGHT LOAD ADJUSTMENT ASSEMBLY FOR INDUCTION METERS

**James E. Ramsey, Jr., Raleigh, and Auburn K. Griffin, Jr., Sanford, both of N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jun. 10, 1981, Ser. No. 272,246**
**Int. Cl.³ G01R *11/02***
**U.S. Cl. 324—137** **8 Claims**

1. An induction meter including a voltage and a current magnetic section each producing magnetic flux and a rotatable disk driven at a rate responsive to said magnetic flux directed from said magnetic sections into said disk, wherein said voltage magnetic section comprises:

a substantially E-shaped laminated magnetic core having a center leg terminating at a main pole face and two adjacent legs terminating at coplanar auxiliary pole faces on opposite sides of said main pole faces, said first and last laminae defining a first and a second side, respectively, of said core;

a voltage coil wound about said center leg;

a voltage shunting member located in magnetic proximity to said first side for providing a magnetic flux shunt path between said pole faces;

a nonmagnetic spacer located between said first side and said voltage shunting member and lying in a plane substantially parallel to said first side, a portion of said spacer extending beyond one of said adjacent legs in a direction opposite from said center leg and including means for supporting a screw;

a screw carried by said screw support means of said spacer extending portion;

a movable tab having a threaded portion cooperating with said screw, said tab being oriented so as to extend over portions of one of said auxiliary pole faces and said main pole face thereby providing an adjustable magnetic flux shunt path.

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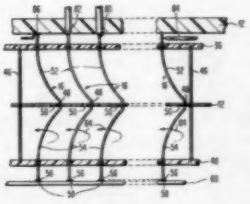
**4,423,376**

## CONTACT PROBE ASSEMBLY HAVING ROTATABLE CONTACTING PROBE ELEMENTS

**Herbert P. Byrnes, Poughkeepsie, and Richard Wahl, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Mar. 20, 1981, Ser. No. 245,818**
**Int. Cl.³ G01R *1/06, 31/02***
**U.S. Cl. 324—158 P** **12 Claims**



1. An electrical probe assembly comprising

a plurality of elongated probe elements formed of conductive and flexible material, each having a length many times its diameter,

spaced upper and lower flat support elements haaving apertures receiving the ends of said probe elements and maintaining said probe elements in generally parallel arrangement with at least the lower ends in a configuration corresponding to the pad configuration to be contacted, and protruding beyond the lower support element,

a means to simultaneously rotate said probe element wherein said probe elements are each pre-bent with a central portion displaced laterally from the longitudinal axis through the ends,

a flat probe rotating element disposed between said upper and lower support elements, said probe rotating element provided with apertures receiving the central portions of said pre-bent probe elements,

cam surfaces on said probe rotating element,

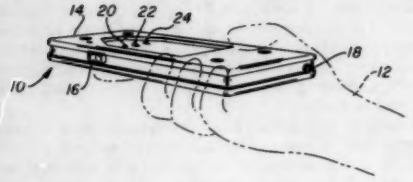
cam followers mounted stationery relative to said upper and lower flat support elements and cooperating with said cam surfaces, said cam surfaces and said cam followers adapted to impart an arcuate movement to said probe rotating element which in turn imparts a rotary movement to said probe elements, and

a means to impart movement to said probe rotating element.

## 4,423,377
## COMPACT METAL DETECTOR OF THE BALANCED INDUCTION TYPE

**Robert J. Podhrasky, Dallas, Tex., assignor to Garrett Electronics, Garland, Tex.**

**Filed Nov. 12, 1980, Ser. No. 206,182**
**Int. Cl.³ G01V** *3/11, 3/165*
**U.S. Cl. 324—329** **6 Claims**




1. A compact metal detector of the balanced induction type comprising:

(a) a planar assembly having a perimeter, a transmit coil disposed on said assembly enclosing a planar transmit coil area, a receive coil disposed on said planar assembly enclosing a planar receive coil area, said receive coil area being coplanar with the transmit coil area, and said receive coil being disposed adjacent said transmit coil;

(b) a planar circuit board having a perimeter substantially corresponding to the perimeter of said planar assembly, said planar circuit board disposed parallel and above said planar assembly such that said entire transmit and receive coil areas are covered by said planar circuit board; and

(c) circuit means including alternating current components which produce a high level oscillating current in response to signals produced in said receive coil and provide said high level oscillating current to a speaker, said components located on said planar circuit board exterior of said receive coil area such that said high level oscillating current does not induce a corresponding high level oscillating current in said receive coil.

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## 4,423,378
## AUTOMOTIVE BATTERY TEST APPARATUS

**Joseph A. Marino, Waukesha, Wis., and Sydney J. Roth, Largo, Fla., assignors to Bear Automotive Service Equipment Company, Milwaukee, Wis.**

**Filed Dec. 4, 1981, Ser. No. 327,586**
**Int. Cl.³ G01N** *27/46*
**U.S. Cl. 324—427** **12 Claims**

1. A battery test apparatus for testing conditions of a storage battery of an internal combustion engine powered vehicle, the battery testing apparatus comprising:

connection means for connecting the battery test apparatus to positive (+) and negative (−) terminals of the battery;

means connected to the connection means for providing a first electrical signal representative of measured dynamic internal resistance of the battery;

means connected to the connection means for providing a second electrical signal representative of measured open circuit voltage of the battery;

means connected to the connection means for providing a third electrical signal representative of measured voltage of the battery with a predetermined DC load connected between the + and − terminals;

means for providing a fourth electrical signal representative of measured temperature of the battery;

means for deriving a value Rd representative of dynamic internal resistance of the battery based upon the first signal;

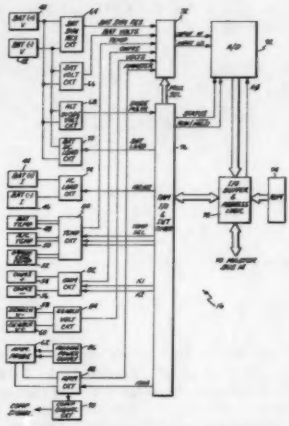
means for deriving a valve Voc representative of temperature corrected open circuit voltage from the second and fourth signals;

means for deriving a value Pd representative of maximum power transfer from the battery based upon Voc and Rd;

means for deriving a value T representative of temperature of the battery from the fourth signal;

means for deriving a value $P_{100\%}$ representative of power rating of the battery at 100% state-of-charge from the values T, Pd and Voc;

means for determining a battery rating of the battery based upon $P_{100\%}$;



means for deriving a reference value as a function of the battery rating which represents a predetermined state-of-charge which is less than 100%;

means for deriving a temperature corrected measured voltage value under DC load conditions from the third and fourth signals;

means for comparing the temperature corrected measured value with the reference voltage value; and

means for providing an indication of battery condition based upon the comparison.

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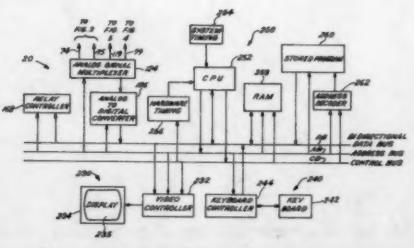
## 4,423,379
## BATTERY TESTING TECHNIQUES

**William R. Jacobs, Wilmete; Richard A. Karlin, Chicago, both of Ill., and Peter K. Sun, Hong Hong, Hong Kong, assignors to Sun Electric Corporation, Crystal Lake, Ill.**

**Filed Mar. 31, 1981, Ser. No. 249,359**
**Int. Cl.³ G01N** *27/46*
**U.S. Cl. 324—429** **28 Claims**




1. In a system for testing a battery having an internal impedance, improved apparatus for determining and displaying the condition of the battery comprising:

converter means for generating digital battery parameter values corresponding to parameters of the battery at different points in time;

loading means for placing an electrical load on the battery in response to a load signal;

charging means for charging the battery in response to a charge signal;

display means for indicating the condition of the battery in response to an analysis signal; and

processor means for generating the load signal during part of a first portion of time thereby electrically loading the battery, generating the charge signal during part of a second portion of time following the first portion of time to enable the charging of the battery, generating the load signal during part of a third portion of time following the second portion of time thereby electrically loading the battery, storing a first battery parameter value generated by the converter means during a part of the first portion of time when the load signal is absent and the battery therefore is unloaded, storing a second battery parameter value generated by the converter means during a part of the third portion of time when the load signal is present and the battery therefore is loaded, calculating the condition of the battery based on at least the first and second stored parameter values, and generating an analysis signal, so that the condition of the battery is displayed by the display means.

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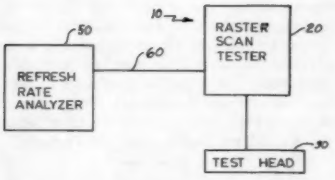
**4,423,380**

## METHOD OF TESTING A MEMORY BY SCANNING AT INCREASING TIME INTERVALS

**Douglas C. Pileri, Tonawanda, N.Y., assignor to Burroughs Corporation, Detroit, Mich.**

**Filed Aug. 26, 1980, Ser. No. 181,471**
**Int. Cl.³ G01R 33/12, 15/12**
**U.S. Cl. 324—73 R** **1 Claim**




1. The method of testing electronic memories comprising the steps of

writing information into all cells in a memory,

after a first interval of time, scanning the memory to determine whether all cells of the memory retain their information,

after a second interval of time, longer than the first interval and beginning at the end of the scan after the first interval of time, resuming scanning the memory to determine whether all cells of the memory retain their information,

after a third interval of time, longer than the second interval and beginning at the end of the scan after the second interval of time, resuming scanning the memory to determine whether all cells of the memory retain their information, and

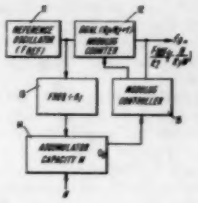
continuing the scanning of the memory after longer and longer time intervals until one or more cells have lost their information.

**4,423,381**

## PULSE CONTROL CIRCUIT

**Elvin Stepp, Cincinnati, and Gary Claypoole, West Chester, both of Ohio, assignors to Cincinnati Electronics Corporation, Cincinnati, Ohio**

**Filed Jan. 16, 1981, Ser. No. 225,721**
**Int. Cl.³ H03L 7/18**
**U.S. Cl. 328—14** **30 Claims**



1. A circuit for deleting cycles from a wave source or for synthesizing a frequency in response to a reference oscillator source comprising a dual modulus counter responsive to the source, said dual modulus counter having first and second states for selectively decreasing the number of cycles of the wave source by first and second factors, respectively, means responsive to the source for reducing the number of cycles of the wave source by a third factor to derive a control signal having an output frequency that is a sub-multiple of the frequency of the source, and means responsive to the control signal for controlling when the dual modulus counter is activated to have the first and second factors as a function of the time of a transition of the control signal, wherein occurrence times of said transitions are determined by the output frequency of the control signal.

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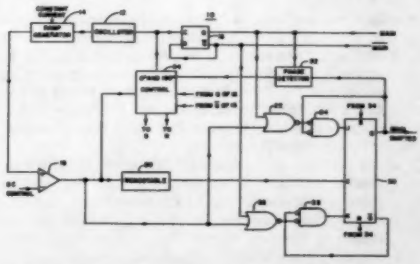
**4,423,382**

## CIRCUIT FOR GENERATING TWO PERIODIC SIGNALS HAVING A CONTROLLABLE PHASE RELATIONSHIP THEREBETWEEN

**Dustin J. Becker, Lorain, Ohio, assignor to Reliance Electric Company, Cleveland, Ohio**

**Filed Aug. 10, 1981, Ser. No. 291,454**
**Int. Cl.³ H03K 5/153**
**U.S. Cl. 328—55** **10 Claims**



1. A circuit for generating as a funtion of the amplitude of a d.c. control signal at least two periodic output signals having a phase relationship controllable between zero and 180 degrees, said circuit comprising:

(a) oscillator means for generating a periodically recurring signal of predetermined frequency and waveform said signal having during each period a first portion of first predetermined amplitude and a second portion of second predetermined amplitude said signal not being either of said at least two periodic output signals;

(b) means responsive to said oscillator signal for generating a periodically recurring signal having a ramp waveform said ramp starting each time said first portion of said oscillator signal begins;

(c) means for comparing said ramp signal to said d.c. control signal said comparison means generating a signal having a first amplitude when said d.c. control signal exceeds said ramp signal and a second amplitude when said ramp signal exceeds said control signal;

(d) first output means responsive to the beginning of said first portion of said oscillator signal for generating simultaneously one of said periodic output signals and another identical signal having a 180 degree phase relationship thereto; and

(e) second output means responsive to said signal generated by said comparator means and said signals generated by said first means for generating when said comparator means signal changes from said first amplitude to said second amplitude at least the other of said periodic output signals whereby the phase relationship between said one and said other periodic output signals is controlled as a function of said d.c. control signal to be between zero and 180 degrees.

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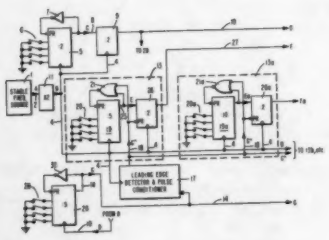
**4,423,383**

## PROGRAMMABLE MULTIPLE FREQUENCY RATIO SYNCHRONOUS CLOCK SIGNAL GENERATOR CIRCUIT AND METHOD

**Gordon D. Svendsen, Belmont, Calif., assignor to Ampex Corporation, Redwood City, Calif.**

**Filed Mar. 5, 1982, Ser. No. 355,284**
**Int. Cl.³ H03K *5/15*; H03L *7/00***
**U.S. Cl. 328—63** **9 Claims**



1. A circuit for providing synchronous clock signals, each having a selected integral frequency division ratio with respect to a master clock signal frequency, respectively, comprising:

a first programmable ratio frequency divider means having an input for receiving said master clock signal and having an output for providing a first clock signal whose frequency is preset by said first divider means to have an integral frequency division ratio with respect to said master clock signal frequency;

at least one second programmable ratio frequency divider means each having an input for receiving said master clock signal and an output for providing a second clock signal whose frequency is preset by said second divider means to have an integral frequency division ratio with respect to said master clock signal frequency;

a third programmable ratio frequency divider means having an input for receiving said first clock signal and having an output for providing a third clock signal whose frequency is preset by said third divider means to have respective integral frequency division ratios with respect to said first and all said second clock signals, respectively; and

a synchonizing means having a first input for receiving said master clock signal and a second input for receiving said third clock signal and providing a synchronizing signal having a frequency corresponding to that of said third clock signal and synchronous therewith, said synchronizing signal being coupled to periodically preset each said second programmable ratio frequency divider means to obtain synchronization of said respective second clock signals with both said first and third clock signals, respectively.

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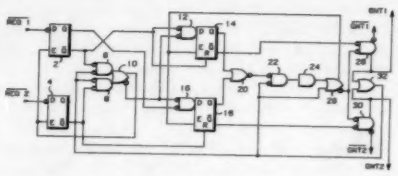
**4,423,384**

## ASYNCHRONOUS MULTI-PORT ARBITER

**Richard M. DeBock, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Dec. 21, 1981, Ser. No. 333,151**
**Int. Cl.³ H03K *5/26***
**U.S. Cl. 328—152** **8 Claims**



1. An arbitration circuit for granting control of a shared resource to one of a plurality of ports based upon a predetermined scheme of priority, comprising:

input means for receiving request signals from said plurality of ports;

first means for indicating if one of said plurality of ports has been granted control of said resource;

second means coupled to said input means and to said first means for latching said request signals in said input means if none of said plurality of ports has control of said resource;

third means coupled to said input means and to said second means for generating a priority signal indicative of which port has priority;

fourth means coupled to said third means and to said first means for latching the state of said third means; and

fifth means coupled to said third and fourth means and having outputs coupled to said first means for generating a resource grant signal for transmission to a requesting port, said second means unlatching said input means when said resource grant signal is generated to permit said request signals to pass through said input means, and said fourth means being responsive to the termination of said priority signal for unlatching said third means.

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**4,423,385**

## CHOPPER-STABILIZED AMPLIFIER

**Lee L. Evans, Atherton, Ga., assignor to Intersil, Inc., Cupertino, Calif.**

**Filed Jun. 10, 1981, Ser. No. 272,362**
**Int. Cl.³ H03F *1/26, 3/45***
**U.S. Cl. 330—9** **16 Claims**

1. An operational amplifier circuit comprising:

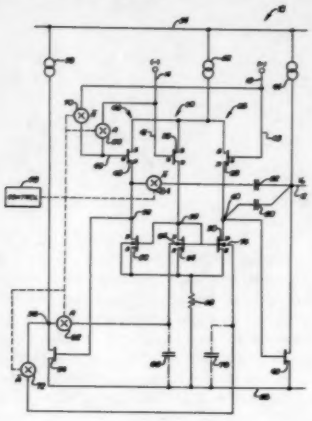
a first input leg having a first active input element and a first active load element;

a second input leg having a second active input element and a second active load element, said first leg and second leg being operably connected as a differential pair;

a reference leg having a reference active input element and a reference active load element, said reference leg being operably connected as a differential pair with the first leg and as a differential pair with the second leg;

switching means for operably connecting the inputs of the first active input element and the reference active input element together such that an offset between the first leg and the reference leg appears as a voltage change at an

output of the reference active load element, and for operably connecting the output of the reference active load element to an input of the first active load element whereby the voltage at the input of the first active load element will be adjusted to compensate for any offset between the first leg and the reference leg to balance the first leg and reference leg, said switching means also for operably connecting the inputs of the second active input



element and the reference active input element together while operably connecting an output of the reference active load element to an input of the second active load element whereby the voltage at an input of the second active load element will be adjusted to compensate for any offset between the second leg and the reference leg to balance the second leg and the reference leg;

whereby the first leg and the second leg will also be balanced with respect to each other.

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**4,423,386**

## MULTISIGNAL AMPLIFICATION

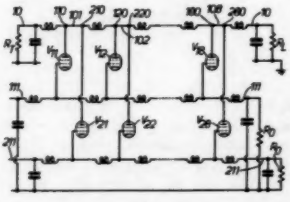
**Roger E. J. Gerard, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England**

**Filed Oct. 27, 1980, Ser. No. 201,264**

**Claims priority, application United Kingdom, Nov. 7, 1979, 7938628**

**Int. Cl.³ H03F *3/60***

**U.S. Cl. 330—54** **7 Claims**



1. A modified distributed amplifier comprising:

at least two unmodified distributed amplifiers each having a separate input line and a plurality of amplifying elements connected to said separate input line, each said amplifying element having an output and all of said amplifying elements of both said unmodified amplifiers being configured substantially identically to one another, and said separate input lines being arranged to couple independent control signals to each of said unmodified amplifiers; a common output line connected to the output of each said amplifying element of said at least two unmodified amplifiers, the connection of said common output line to each said amplifying element of a respective one of said unmodified amplifiers being independent of the connections of said common output line to each said amplifying element of the others of said at least two unmodified amplifiers, wherein all the amplifying elements of each said unmodified amplifier are connected in parallel between said common output line and the associated separate input line.

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**4,423,387**

## CURRENT MIRROR ARRANGEMENT

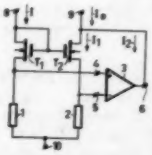
**Adrianus Sempel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Feb. 17, 1981, Ser. No. 235,219**

**Claims priority, application Netherlands, Mar. 13, 1980, 8001492**

**Int. Cl.³ H03F *1/34, 3/04***

**U.S. Cl. 330—85** **19 Claims**



1. A current-source arrangement comprising, a first current circuit coupled between a first terminal and a common terminal, said first circuit comprising at least the main current path of a first semiconductor device connected in series with a first resistor, a second current circuit coupled between a second terminal and the common terminal, said second current circuit comprising at least the main current path of a semiconductor device and a second resistor, the two semiconductor devices being connected in parallel with respect to their drives, an active negative feedback circuit having a differential input and an output, means coupling said differential input between the ends of the first and the second resistor which are remote from the common terminal, and means coupling said output to the second current circuit to provide negative feedback so as to counteract a variation of the voltage across the second resistor relative to the voltage across the first resistor.

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**4,423,388**

## RF AMPLIFIER CIRCUIT EMPLOYING FET DEVICES

**Emil J. Crescenzi, Jr.; Walter T. Wilser, both of Cupertino; Richard W. Oglesbee, Mountain View, all of Calif., and Richard B. Gold, Burlington, Mass., assignors to Watkins-Johnson Company, Palo Alto, Calif.**

**Filed Oct. 29, 1981, Ser. No. 316,130**

**Int. Cl.³ H03F *3/04***

**U.S. Cl. 330—277** **8 Claims**

1. An RF amplifier comprising:

a first FET having source, drain, and gate contacts,

a second FET having source, drain, and gate contacts,

means for applying an input signal to said gate contact of said first FET,

means connecting said source of said first FET to a first potential,

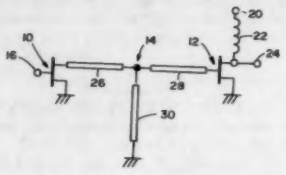
means connecting said source contact of said second FET to a second potential,

means connecting said drain contact of said second FET to a third potential,

coupling means for coupling said first FET with said second FET, said coupling means including first and second

serially connected transmission lines connected between said drain contact of said first FET and said gate contact of said second FET, and a third transmission line interconnected to a common terminal of said first and second transmission lines and a fourth potential, and

means for extracting an output signal from said drain contact of said second FET,




said RF amplifiers being characterized by said first FET and said second FET being formed in a monolithic semiconductor body with said first transmission line, said second transmission line, and said third transmission line comprising microstrip on a surface of said semiconductor body.

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**4,423,389**

**AMPLIFIER WITH POWER SUPPLY SWITCHING**

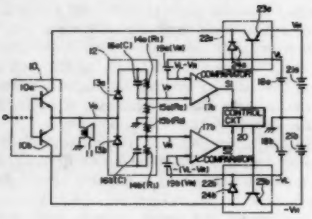
**Tatsuo Fushiki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan**

**Filed May 6, 1981, Ser. No. 261,050**

**Claims priority, application Japan, May 21, 1980, 55-67450**

**Int. Cl.³ H03F *3/04***

**U.S. Cl. 330—297** **21 Claims**




1. An amplifier of the power supply connection changeover type, comprising:

a plurality of power supplies having different voltages;

amplifying means adapted to be supplied with a voltage from the power supplies;

connection changeover means for selectively connecting one of the power supplies to the amplifying means; and

comparing means for comparing a reference voltage with a voltage of a signal amplified by said amplifying means, wherein the value of the reference voltage varies in accordance with variations in the voltage of at least a selected one of the power supplies;

said connection changeover means being controlled based on a result of comparison done by said comparing means.

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**4,423,390**

**SIDE LOCK AVOIDANCE NETWORK FOR PSK DEMODULATOR**

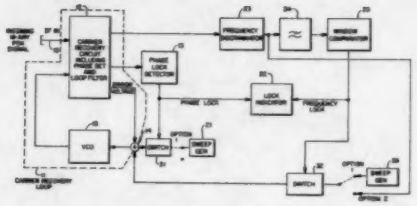
**George W. Waters, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.**

**Filed Jan. 9, 1981, Ser. No. 223,574**

**Int. Cl.³ H03L *7/12***

**U.S. Cl. 331—4** **18 Claims**

1. An apparatus for preventing a phase-lock loop, including a phase detector and a voltage controlled oscillator, from achieving sidelock, in response to an input signal including components at a desired lock frequency and a sideband component separated from said desired lock frequency, said loop further including a lock detector coupled to the output of said phase detector, and a sweep voltage generator, the output of said sweep voltage generator being selectively coupled to said voltage controlled oscillator in accordance with the output of said lock detector, comprising:




first means, coupled to the output of said phase detector, for generating an error voltage representative of the degree of separation of the output of said phase detector and a voltage representative of said desired lock frequency; and

second means, responsive to said error voltage, for coupling a voltage, the magnitude of which varies with time and is exclusive of said sweep voltage generator, as an auxiliary control voltage to said voltage controlled oscillator.

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**4,423,391**

**EQUALIZER CIRCUIT FOR COMMUNICATION SIGNALS**

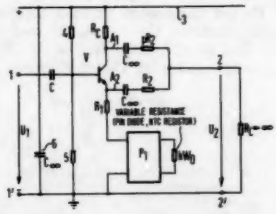
**Peter Ebenhoch, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany**

**Filed Jul. 20, 1981, Ser. No. 284,657**

**Claims priority, application Fed. Rep. of Germany, Sep. 8, 1980, 3033762**

**Int. Cl.³ H03H *7/03***

**U.S. Cl. 333—28 R** **9 Claims**



1. An active Bode equalizer circuit comprising:

a circuit input for receiving communication signals and circuit output, including first and second terminals, for emitting anti-phase equalized signals;

an amplifier including an input connected to said circuit input and first and second outputs;

a first resistor, forming a first bridge arm, connected between said first output and a supply potential;

a second resistor, forming a second bridge arm, connected between said first output and said first terminal of said circuit output;

a third resistor, forming a third bridge arm, connected to said second output and to said first terminal of said circuit output;

a two-terminal network, forming a fourth bridge arm, connected to a reference potential, said second terminal of

said circuit output also connected to the reference potential,

said two-terminal network comprising a matched bridged T-section, including first and second ports, and a terminating impedance connected across said second port; and

a fourth resistor connected in circuit with said second output and said first port of said T-section.

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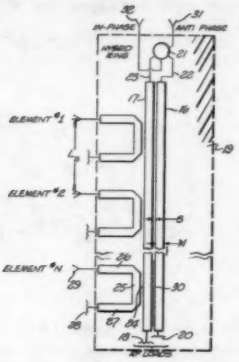
**4,423,392**

## DUAL-MODE STRIPLINE ANTENNA FEED PERFORMING MULTIPLE ANGULARLY SEPARATED BEAMS IN SPACE

**Ronald I. Wolfson, 10966 Beckford Ave., Northridge, Calif. 91326**

**Filed Nov. 30, 1981, Ser. No. 325,686**
**Int. Cl.³ H01P 5/18; H01Q 3/26**
**U.S. Cl. 333—116** **7 Claims**




1. An antenna feed having first and second transmit/receive ports and a plurality of antenna element ports for connection to the elements of a linear antenna array to generate at least two angularly separated beams in space therefrom, comprising:

a length of non-dispersive TEM transmission line having first and second generally parallel, laterally-spaced center conductors associated with a dielectric material and discretely connected to said first and second transmit/-receive ports, respectively, the other ends of said center conductors being discretely load terminated;

first means comprising a phasing device having in-phase and anti-phase ports and third and fourth ports connected to said transmission line first and second transmit/receive ports, respectively, said phasing device being operative to excite said center conductors in-phase to generate an even electric field mode within said transmission line during excitation of said in-phase port and to excite said center conductors in anti-phase relationship to generate an odd electric field mode within said transmission line during excitation of said anti-phase port;

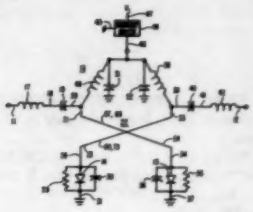
second means comprising a plurality of couplings, one for each of said antenna element ports, said couplings each including a quarter-wave conductor parallel and close coupled to one of said center conductors and a feed strip extending generally perpendicular from one end of each of said coupling strips to a corresponding antenna element port, said coupling strips being load terminated from their other ends.

**4,423,393**

## HIGH SPEED OCTAVE BAND PHASE SHIFTER

**Ronald G. Freitag, Ellicott City, and Jeffrey A. Kruth, Ferndale Township, Anne Arundel County, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Feb. 4, 1982, Ser. No. 345,839**
**Int. Cl.³ H01P 1/185, 5/12, 5/04**
**U.S. Cl. 333—164** **10 Claims**



1. Apparatus for shifting the phase of microwave signal comprising:

a coupler operable over a wide bandwidth in frequency and having first through fourth ports,

said first port adapted for coupling an input microwave signal thereto,

said fourth port adapted for coupling an output microwave signal therefrom,

a first diode and first resistor coupled across said second port,

a second diode and second resistor coupled across said third port,

means adapted for coupling a bias current to said first and second diodes whereby the diodes are forward biased during a first time interval and reverse biased during a second time interval,

said first and second resistors having a predetermined resistance to absorb microwave power at said diodes during said second time interval to provide substantially the same insertion loss at said fourth port during said first and second time intervals.

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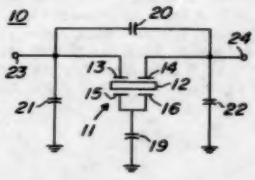
**4,423,394**

## MULTIPLE POLE BANDPASS FILTER HAVING MONOLITHIC CRYSTAL ELEMENTS

**Robert G. Kinsman, Naperville, Ill., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Jun. 6, 1977, Ser. No. 803,903**
**Int. Cl.³ H03H 9/52, 9/56, 9/60**
**U.S. Cl. 333—192** **12 Claims**




1. A filter for providing a symmetrical response about a given center frequency including a piezoelectric resonating element having first and second opposite sides with first and second pairs of electrodes thereon and the electrodes of each pair being on opposite sides of the resonating element, means coupled to the first pair of electrodes for applying signals thereto, means coupled to the second pair of electrodes for

deriving selected signals therefrom, a first capacitor coupled between an electrode of the first pair located on the first side and a common terminal, a second capacitor coupled between an electrode of the second pair of electrodes located on the first side and said common terminal, a third capacitor coupled between the electrodes of the first and second pair of electrodes located on the first side, and a fourth capacitor coupled between both of the first and second electrodes located on the second side and said common terminal, the values of said first, second, third and fourth capacitors being selected to provide said predetermined response.

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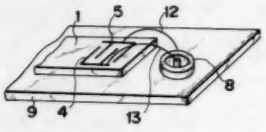
**4,423,395**

**SURFACE ACOUSTIC WAVE FILTER**

**Kengoro Shirahama, Toda, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan**

**Filed Aug. 5, 1981, Ser. No. 290,383**
**Claims priority, application Japan, Aug. 7, 1980, 55-107675**
**Int. Cl.³ H03H** *9/64, 9/05, 9/10*
**U.S. Cl. 333—193** **3 Claims**




1. A surface acoustic wave filter comprising:
a surface acoustic wave element having a first planar surface with input and output electrodes provided thereon;
a metallic board on which said surface acoustic wave element is mounted;
at least two coaxial-type connectors each having an associated shell and central electrode and configured with one end of each said shell and the end of its associated electrode lying in an end-defining plane, said connectors diposed to place their respective end-defining planes coplanarly with respect to said first planar surface;
a first pair of wires connected between said input electrodes and said shell and central electrode respectively at said one end of one of said coaxial-type connectors, said first pair of wires being disposed in parallel; and
a second pair of wires connected between said output electrodes and said shell and central electrode respectively at said one end of another of said coaxial-type connectors, said second pair of wires being disposed in parallel.

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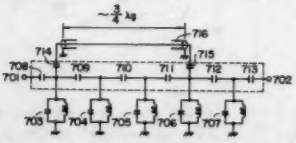
**4,423,396**

**BANDPASS FILTER FOR UHF BAND**

**Mitsuo Makimoto, Yokohama, and Sadahiko Yamashita, Sagamihara, both of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan**

**Filed Sep. 29, 1981, Ser. No. 306,855**
**Claims priority, application Japan, Sep. 30, 1980, 55-137205**
**Int. Cl.³ H03H** *7/01;* **H01P** *1/203, 7/08*
**U.S. Cl. 333—204** **9 Claims**




1. A bandpass filter for UHF band, comprising:
(a) a dielectric substrate;
(b) a main transmission line having input and output electrodes, said main transmission line being formed of a plurality of striplines formed in line on said dielectric substrate;
(c) five or more resonators respectively coupled to said striplines between said input and output electrodes;
(d) first and second coupling striplines formed on said dielectric substrate, said first coupling stripline being located adjacent to the first stripline which is immdediately next to said input electrode, said second coupling stripline being located adjacent to the fourth stripline; and
(e) a sub transmission line stripline formed on said dielectric substrate and interposed between said first and second coupling striplines.

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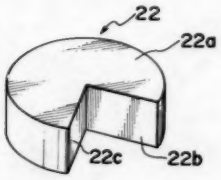
**4,423,397**

**DIELECTRIC RESONATOR AND FILTER WITH DIELECTRIC RESONATOR**

**Toshio Nishikawa, Nagaokakyo; Youhei Ishikawa; Sadahiro Tamura, both of Kyoto, and Yoji Ito, Takatsuki, all of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan**

**Filed Jun. 25, 1981, Ser. No. 277,389**
**Claims priority, application Japan, Jun. 30, 1980, 55-89599; Jun. 30, 1980, 55-89600**
**Int. Cl.³ H01P** *7/10, 1/208, 1/209*
**U.S. Cl. 333—219** **28 Claims**




1. A dielectric resonator comprising dielectric member, the geometry of said member corresponding to a body with a section removed therefrom, said body being generally symmetrical about an axis and said section being defined by two planes which intersect along said axis and form an angle greater than 0 degrees.

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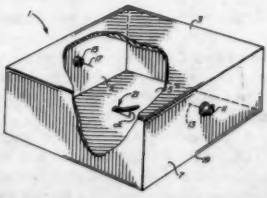
**4,423,398**

**INTERNAL BI-METALLIC TEMPERATURE COMPENSATING DEVICE FOR TUNED CAVITIES**

**Ronald E. Jachowski, Paradise Valley, Ariz., and Louis E. Brown, Dallas, Tex., assignors to Decibel Products, Inc., Dallas, Tex.**

**Filed Sep. 28, 1981, Ser. No. 306,077**
**Int. Cl.³ H01P** *7/04, 7/06, 1/202, 1/207*
**U.S. Cl. 333—229** **11 Claims**



1. A tuned cavity device for producing a resonating standing wave pattern therein, said tuned cavity device comprising in combination:
(a) a housing having a high conductivity inner surface en-

closing a region in which said standing wave pattern resonates;

(b) frequency-determining means for determining a resonant frequency of said tuned cavity device, said frequency-determining means having a non-zero thermal expansion coefficient; and

(c) bi-metallic temperature compensating means disposed in said region and electrically contacting said inner surface for extending from said inner surface into said region, the amount of said extension of said bi-metallic temperature compensating means increasing and decreasing as the temperature of said tuned cavity device decreases and increases, respectively, to compensate for thermal expansion and contraction of said frequency-determining means as a function of temperature of said tuned cavity device, said bi-metallic temperature compensating means including a strip of bi-metallic material having a first portion attached to a portion of said inner surface and a relatively flat second portion inclined at an acute angle relative to said portion of said inner surface, said strip of bi-metallic material bending with variation in temperature.

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**4,423,399**

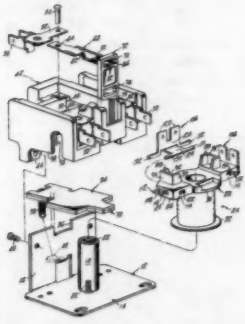
**ELECTROMAGNETIC CONTACTOR**

**Ronald W. Goodrich, Logansport, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.**

**Filed Apr. 23, 1982, Ser. No. 371,107**

**Int. Cl.³ H01H *45/04***

**U.S. Cl. 335—202** **6 Claims**



1. In an electromagnetic contactor of the type comprising an L-shaped frame having a base portion and a leg portion, a coil assembly comprising a bobbin having end flanges and a coil wound about said bobbin between said flanges, a core secured at one end to said base portion and carrying said coil assembly, an armature pivotally mounted on said leg portion for movement toward and away from the other end of said core, a block of insulating material having foot portions secured directly to said leg portion and having a platform portion disposed substantially at right angles to said foot portions to extend over said armature and said coil assembly, a contact spring mounted cantilever fashion on said block and carrying a movable contact, another contact mounted on said block for engagement by said movable contact, and an actuator engaging said contact spring and operable by said armature for flexing said contact spring toward said other contact; cooperating interlocking means on said bobbin and said block for rigidly supporting said platform portion relative to said frame at a location spaced from said foot portions which comprise: a pair of oppositely directed integral support arms extending outwardly beyond opposite sides of said armature and said platform portion; said platform portion including two spaced apart wall members projecting from respective ledge surfaces toward said arms and defining a chamber therebetween; an upstanding projection integrally formed on each of said arms and projecting into said chamber for mating engagement with a corresponding one of said wall members and a respective ledge surface; and locking means on said wall members for providing frictional engagement with said projections when said platform portion is forcibly urged over said projections to bring said projections into mating engagement with said wall members.

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**4,423,400**

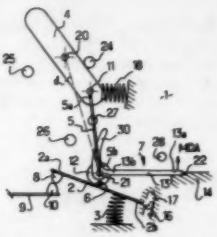
**CONTROL DEVICE TO BE MOUNTED IN A FRAME FOR OPERATING THE DISPLACEMENT OF AN ARM AND USE OF THE DEVICE IN PARTICULAR AS A SWITCH**

**Jean A. E. Marcoz, 93, avenu Albert 1er, 92500 Rueil Malmaison, France**

**Filed Jul. 15, 1981, Ser. No. 283,785**

**Int. Cl.³ H01H *71/16***

**U.S. Cl. 337—72** **30 Claims**



1. In an apparatus including an arm and a control device adapted to be mounted in a frame for controllably operating the displacement of said arm in a plane between at least two positions, including a first off position and a second working position, the improvement wherein said control device comprises:

a control member mounted for movement in the plane of displacement of the arm between at least two positions including a first inoperative position corresponding to said off position of said arm and a second operative position corresponding to said working position of said arm, a transmission element coupled to said control member and bearing on said arm in freely moving engagement therewith so as to be movable along said arm in the plane of displacement of the arm between at least three positions including a first engaged position wherein the arm is in said working position, a second disengaged position and a third reset position wherein in said second and third positions, the arm is in said off position; and

a locking device including an integral elongate element having two ends, said locking device mounted for displacement between at least two positions including a first locked position and a second unlocked position, and stop means, one end of said elongate element adapted to bear against said stop means wherein said locking device is in said locked position, the other end of said elongate element being connected to said transmission element, and wherein said locking device is displaced to said locked position when said transmission element is moved toward said third reset position.

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**4,423,401**

**THIN-FILM ELECTROTHERMAL DEVICE**

**Robert A. Mueller, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.**

**Filed Jul. 21, 1982, Ser. No. 400,331**

**Int. Cl.³ H01H *61/02***

**U.S. Cl. 337—107** **12 Claims**

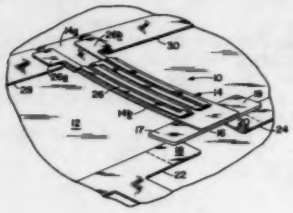
1. A thin-film electrothermal device, comprising

a substrate having an insulative support surface,

a first conductive body bonded to said surface,

a resiliently bendable strip of dielectric material overlying said surface and spaced therefrom over a portion of its length,

a second conductive body secured to said strip and supported thereby for movement toward and away from said



first body by bending of said strip toward and away from said surface, and

an electrical resistance element bonded to said strip to effect controlled bending of the strip toward and away from said surface in response to the flow of electrical current through said element.

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**4,423,402**

## TEMPERATURE SENSITIVE CAPSULES

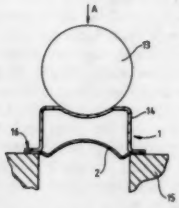
**Thomas M. Jackson, and Robert J. Hodges, both of Hertfordshire, England, assignors to ITT Industries, Inc., New York, N.Y.**

**Filed Apr. 26, 1982, Ser. No. 371,674**

**Claims priority, application United Kingdom, Jul. 21, 1981, 8122394**

**Int. Cl.³ H01H *37/36***

**U.S. Cl. 337—323** **10 Claims**



1. A capsule, for use as a temperature responsive element, comprising a sealed enclosure containing a liquid or gas, one wall of the enclosure being a bowed disc, wherein when the temperature to which the capsule is subjected passes through a predetermined value the vapour pressure within the enclosure changes in such a way as to cause the bowed disc to change from a concave state to a convex state, or vice versa, and wherein the disc is manufactured from precipitation hardened stainless steel or precipitation hardened beryllium copper.

**4,423,403**

## TRANSPARENT CONDUCTIVE FILMS AND METHODS OF PRODUCING SAME

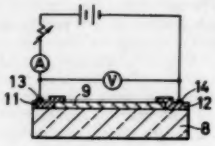
**Kiyoshi Miyake, and Naoyuki Miyata, both of Ube, Japan, assignors to Hitachi, Ltd. and Kiyoshi Miyake, both of Tokyo, Japan**

**Division of Ser. No. 936,124, Aug. 23, 1978, Pat. No. 4,349,425. This application Apr. 16, 1982, Ser. No. 369,078**

**Claims priority, application Japan, Sep. 9, 1977, 52-107984; Jul. 7, 1978, 53-81881**

**Int. Cl.³ H01L *31/08***

**U.S. Cl. 338—15** **8 Claims**



3. A structure comprising a substrate, a transparent film comprising a mixture of $Cd_2SnO_4$ and $CdSnO_3$ formed on the surface of said substrate, and an electrode connected to said transparent film.

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**4,423,404**

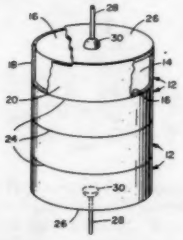
## NON-LINEAR RESISTOR STACK AND ITS METHOD OF ASSEMBLY

**Gary L. Goedde, Racine, and Charles H. Rice, Franksville, both of Wis., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.**

**Filed Feb. 1, 1982, Ser. No. 344,643**

**Int. Cl.³ H01C *7/12***

**U.S. Cl. 338—21** **3 Claims**



1. A non-linear resistor assembly, comprising: a plurality of individual voltage dependent, non-linear resistance wafers, each of which has opposite end surfaces to which solder will adhere and an outer circumferential side surface extending between the end surfaces; said wafers being stacked in end-to-end relationship with one another; an outer coating layer covering the entire side surface of each of said wafers, each of said coating layers being formed from a dielectric composition to which soldering substance does not adhere, said composition being able to withstand the temperature of molten solder and the maximum expected voltage level across each wafer without any adverse effects; and hardened soldering substance between the adjacent ends of adjacent wafers for bonding the adjacent wafers together, said coating layer being a lead glass frit composition consisting essentially of the following, by approximate dry weight percent:

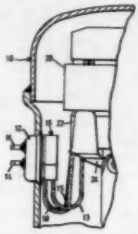
lead oxide . . . 59.2%
silicone dioxide . . . 19.9%
boron oxide . . . 14.5%
sodium oxide . . . 6.4%.

4,423,405

## STARTING RELAY OF THE PTC RESISTOR TYPE IN MOTOCOMPRESSORS FOR REFRIGERATORS

Alfredo Bar, Pavia, Italy, assignor to NECCHI Societa per Azioni, Pavia, Italy

Filed May 11, 1982, Ser. No. 377,051
Claims priority, application Italy, May 20, 1981, 42911 A/81
Int. Cl.³ H01C 7/02
U.S. Cl. 338—25 1 Claim



1. Starting relay of the resistor type with positive temperature coefficient in motor compressors for refrigerators, comprising a hermetically sealed walled container, a two-pin electrical connection fastened on the outside of said container, on the inside of said container a collector of three motor feed connectors, pins provided on the hermetic electrical connection fastened on the wall of said container and a disc resistor embodied in the collector positioned between two of the motor feed connectors.

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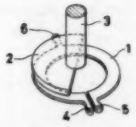
4,423,406

## NON-CONTACT TYPE POTENTIOMETER

Eiji Nakano, Sakuramura Namiki, Japan, assignor to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 353,972
Claims priority, application Japan, Mar. 31, 1981, 56-47592
Int. Cl.³ H01L 43/02
U.S. Cl. 338—32 R 18 Claims




1. A non-contact type potentiometer, comprising:

a first magnetic reluctance element having first means for accepting the application of a standard voltage thereto, and second means for delivering an output voltage therefrom;

a second magnetic reluctance element having first means for accepting the application of a standard voltage thereto, and second means for delivering an output voltage therefrom;

said first and second magnetic reluctance elements being angularly offset with respect to each other by means of 90°; and

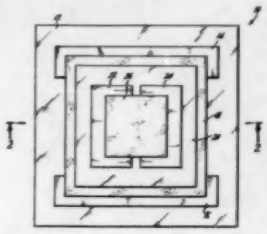
permanent magnet means rotatably disposed relative to, yet separated from, said first and second magnetic reluctance elements for applying a magnetic field to said first and second magnetic reluctance elements.

4,423,407

## APPARATUS AND METHOD FOR MEASURING THE CONCENTRATION OF GASES

Matthew Zuckerman, Carmel, Calif., assignor to Dart Industries, Inc., Colmar, Pa.

Filed Feb. 27, 1981, Ser. No. 238,768
Int. Cl.³ H01L 7/00
U.S. Cl. 338—34 16 Claims



1. A gas sensor which is adapted to change electrical resistance in response to the presence of a gas comprising a metal, an oxide of said metal and an inert support material, all said constituents being formed together into a porous mass.

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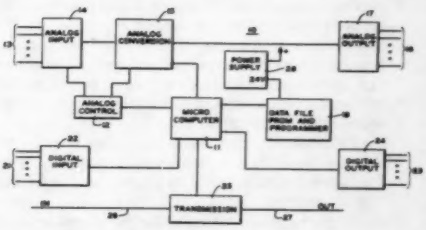
4,423,408

## REMOTE DATA GATHERING PANEL

William C. Place, Acton, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 9, 1981, Ser. No. 232,793
Int. Cl.³ H03K 13/20
U.S. Cl. 340—347 NT 20 Claims




1. A data gathering panel for conversion of analog values into digital values comprising:

input terminal means adapted to be connected to at least one analog sensor for receiving an analog value;

memory means for storing a base value and a range value for said at least one analog sensor;

base means connected to said memory means for applying said base value to said analog value; and,

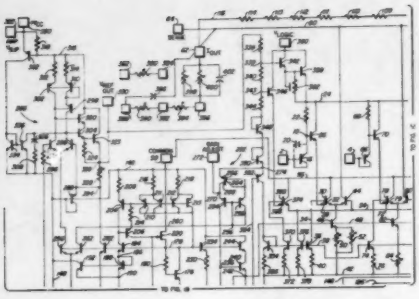
analog-to-digital conversion means connected to said analog input terminal means, to said base means and to said memory means for converting said analog value into a digital value, said conversion means determining said digital value by utilizing said analog value, said base value and said range value, said analog-to-digial conversion means comprising a hex slope analog-to-digital converter and an integrator, said integrator being charged from a reference level to a level determined by said analog value and then discharged to said reference level, said integrator being charged to a level determined by said base value and being discharged to said reference level, and said integrator being charged to a level determined by said range value and being discharged to said reference level.

4,423,409

## DIGITAL-TO-ANALOG CONVERTER HAVING SINGLE-ENDED INPUT INTERFACE CIRCUIT

Jimmy R. Naylor; William J. Lillis, and Anthony D. Wang, all of Tucson, Ariz., assignors to Burr-Brown Research Corporation, Tucson, Ariz.

Filed Apr. 3, 1981, Ser. No. 250,868
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA 15 Claims



1. A digital-to-analog converter comprising in combination:

a. voltage regulating means for producing a reference voltage;

b. current source means responsive to said reference voltage for producing a bit switch current;

c. single-ended input means for receiving a first logic signal at an input terminal thereof and performing a level translation operation on said first logic signal to produce a second logic signal at an output terminal thereof, said single-ended input means including:

i. a PN semiconductor junction operated in zener breakdown mode and coupled between said input terminal and said output terminal to perform said level translation operation;

ii. an input transistor having a base and an emitter, the base of said input transistor being coupled to said input terminal; and

iii. an emitter follower transistor having an emitter and a base, the base of said emitter follower transistor being coupled to the emitter of said input transistor, and the emitter of said emitter follower transistor being coupled by said PN semiconductor junction to said output terminal of said single-ended input means; and

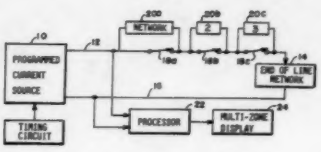
d. current steering means responsive to said second logic signal for selectively steering said bit switch current through a first conductor if said first logic signal is at a first level or through a second conductor if said first logic signal is at a second level, one of said first and second conductors being an output current conductor of said digital-to-analog converter, said current steering means including first, second, and third terminals, said first terminal being coupled to the output terminal of said single-ended input means for receiving said second logic signal, said second terminal being coupled to a threshold voltage conductor for receiving a substantially fixed threshold voltage therefrom, and said third terminal being coupled to said current source means for conducting said bit switch current.

4,423,410

## TWO-WIRE MULTI-ZONE ALARM SYSTEM

Aaron A. Galvin, and Roy L. Harvey, both of Lexington, Mass., assignors to American District Telegraph Company, New York, N.Y.

Division of Ser. No. 951,765, Oct. 16, 1978, Pat. No. 4,359,721.
This application Sep. 2, 1982, Ser. No. 413,987
Int. Cl.³ G08B *25/00*
U.S. Cl. 340—525 3 Claims




1. Apparatus for use in a multi-zone alarm system having a two-wire alarm loop, a plurality of alarm sensors in series with the loop, and a processor at a central location coupled to the loop and operative to indicate an alarm condition in response to alarm signals from any of said sensors, comprising:

a current source serially connected to the alarm loop and operative to provide a predetermined current signal in the loop;

a plurality of networks, each connected across a respective alarm sensor and operative in response to its sensor actuation and to a positive magnitude of said loop signal current to provide a signal pulse for transmission in the loop to the central location processor, the signal pulse having a detectable characteristic to denote the identity of the actuated sensor;

circuit means at the central location processor operative in response to signal pulses from any one or more of the networks to provide a signal indication of the zone in which alarm actuation has occurred; and

each of said networks includes an electronic switch in parallel with the associated alarm sensor; a resistor in shunt with the electronic switch and of a value representing the identity of an associated zone; a capacitor in shunt with said resistor and said electronic switch; the capacitor being operative to minimize radio frequency interference and switching transients from triggering the electronic switch.

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4,423,411

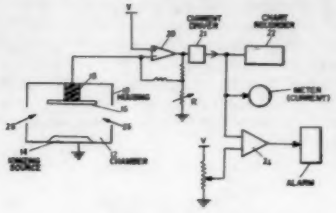
## IONIZATION TYPE FIRE DETECTOR

Nicolaas T. van der Walt, Meredale; Bernardus J. Bout, Walkerville, and Timothy J. Newington, Johannesburg, all of South Africa, assignors to Crucible Society Anonyme, Luxembourg, Luxembourg

Continuation of Ser. No. 96,009, Nov. 20, 1979, abandoned. This application Sep. 2, 1981, Ser. No. 298,804
Claims priority, application South Africa, Nov. 20, 1978, 78/6519
Int. Cl.³ G08B *17/10*
U.S. Cl. 340—629 7 Claims

1. An ionization type fire detector which includes a single measuring chamber provided with one or more apertures in the wall of the chamber to permit the circulation of air through the chamber, an electrode mounted on an insulating member inside the chamber, means for maintaining constant a potential difference between the electrode and the chamber, an ionizing source inside the chamber which produces an ionization cur-

rent which is collected by the electrode, means to collect and amplify the ionization current, and indication means to provide



an indication of a variation with time of the amplified ionization current.

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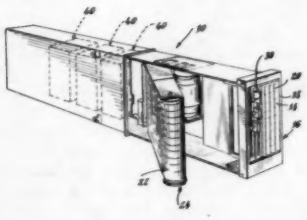
4,423,412

## INDUSTRIAL PROCESS INDICATING/RECORDING APPARATUS USING STEPPING MOTOR DRIVE

Allan L. Flanagan, Attleboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Sep. 30, 1981, Ser. No. 306,955
Int. Cl.³ G08B 21/00
U.S. Cl. 340—661 15 Claims



1. In a process instrument of the type having a movable device representing by its position the level of a process condition being monitored and driven by a stepping motor operated by sequential pulses from clock pulse means, feedback means for developing a feedback signal corresponding to the position of said movable device, and deviation means for producing a deviation signal representing the difference between such feedback signal and a measurement signal; apparatus comprising:

dead-band means responsive to said deviation signal for developing a control signal when said deviation signal falls outside of a predetermined dead-band about the position represented by said measurement signal;

first means responsive to the initial development of said control signal for activating said stepping motor to produce a limited corrective action of preset extent tending to return said device to the position represented by said measurement signal; and

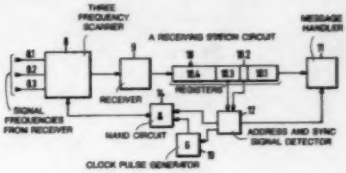
second means including timing means responsive to said control signal for activating said stepping motor beyond said preset extent only if said deviation signal is still outside of said dead-band at the end of a predetermined time period following activation of said stepping motor by said first means.

4,423,413

## RADIOCOMMUNICATION SYSTEM IN WHICH A RECEIVING STATION MONITORS A NUMBER OF TRANSMITTERS BY TIME DIVISION

Herman da Silva, Voorburg, Netherlands, assignor to Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telefonie), The Hague, Netherlands

Filed Jun. 22, 1981, Ser. No. 276,021
Claims priority, application Netherlands, Jun. 30, 1980, 8003783
Int. Cl.³ H04Q 9/00; H04J 3/12; H04B 7/02
U.S. Cl. 340—825.03 3 Claims




1. In a radiocommunication system having a plurality of calling stations and at least one receiving station, and said calling stations having means for transmitting call messages on different frequencies, one corresponding to each calling station for a called receiving station, each of said call messages containing at least an address code for a receiving station, and said receiving station having means for recognizing its address code, the improvement comprising: means in each said calling station for transmitting a call message having a duration t for n times with a call message repetition frequency r, and means in each said receiving station for monitoring, by time division, the different calling frequencies of n calling station, each for a period $T=(n-1)/(n+1)\cdot t/r$.

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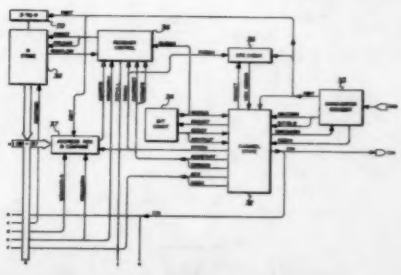
4,423,414

## SYSTEM AND METHOD FOR NAME-LOOKUP IN A LOCAL AREA NETWORK DATA COMMUNICATION SYSTEM

David M. Bryant, Cardiff, Calif.; Ryn C. Corbeil, Bridgewater, N.J.; Michael A. Malcolm, Waterloo, Canada, and Donald R. Thompson, San Diego, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 27, 1981, Ser. No. 296,878
Int. Cl.³ H04Q 9/00; H04J 3/00
U.S. Cl. 340—825.07 6 Claims



1. A station in a communications network including a communications channel for the transmission of packets of information, and a plurality of stations coupled to said channel, said stations being adapted to implement different processes, said a station comprising:

means to receive a process name request from another sta-

tion and to compare said process name with names of processes implemented in said a station; and

means to transmit said a station's address to the requesting station when a comparison match occurs.

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**4,423,415**

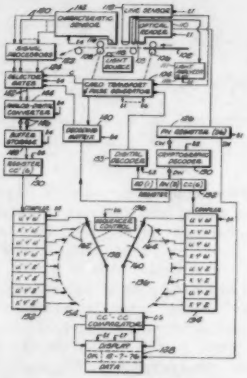
**NON-COUNTERFEITABLE DOCUMENT SYSTEM**

**Robert N. Goldman, Kailua, Hi., assignor to Light Signatures, Inc., Los Angeles, Calif.**

**Continuation-in-part of Ser. No. 161,838, Jun. 23, 1980, abandoned. This application Jun. 22, 1981, Ser. No. 276,282**

**Int. Cl.³ H04Q *9/00*; G06K *19/00, 5/00***

**U.S. Cl. 340—825.34** **40 Claims**



1. An authenticator device for verifying authenticity comprising:

a sheet of medium having a varying random characteristic over an area of said sheet, said characteristic being inherent in the composition of said medium; and

machine-readable indicia on said sheet of medium, said indicia being decodable to specify the characteristic of said sheet at a specific area location.

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**4,423,416**

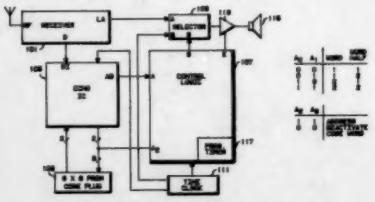
**DECODER FOR TRANSMITTED MESSAGE DEACTIVATION CODE**

**David F. Bailey, Plantation; Merle L. Gilmore, Ft. Lauderdale; Charles J. Ganucheau, Jr., North Lauderdale, all of Fla., and Gary W. Clow, Sierra Madre, Calif., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Oct. 13, 1981, Ser. No. 310,594**

**Int. Cl.³ H04Q *9/00, 7/00*; H04M *11/02***

**U.S. Cl. 340—825.52** **25 Claims**



1. A decoder for a receiver in a plural population of receivers, each said receiver having a predetermined alert sequence and an audio circuit, for receiving transmitted coded information including activation code signals, comprising:

means responsive to received coded signals which designate the address of at least one receiver in said plural population of receivers;

means responsive to the detection and decoding of an address of said receiver for establishing a ready state of said receiver to receive additional information of selectively variable length, subsequent to said received coded signals which designate the address;

means responsive to deactivation code signals immediately after the end of said information of selectively variable length which causes said receiver to terminate processing of said information.

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**4,423,417**

**CAPACITANCE TYPE DISTANCE DETECTING APPARATUS**

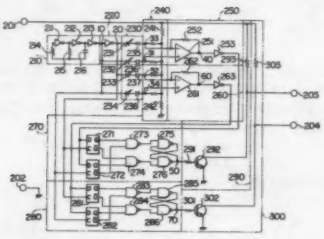
**Hiroaki Tanaka, and Shigeyuki Akita, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan**

**Filed Nov. 6, 1981, Ser. No. 318,856**

**Claims priority, application Japan, Nov. 10, 1980, 55-157807**

**Int. Cl.³ G08C *19/10***

**U.S. Cl. 340—870.37** **5 Claims**



1. A capacitance type distance detecting apparatus comprising:

a first plate including input first and second electrodes arranged alternately at equal spaces;

a second plate including output side first and second electrodes alternately arranged at equal spaces opposite to said input first and second electrodes of said first plate and output side third and fourth electrodes alternately arranged at equal spaces opposite to said first and second electrodes of said first plate when said output side first and second electrodes are not opposite to said input first and second electrodes;

means for relatively moving said electrodes in opposing relation in correspondence with a distance to be measured;

a first comparison circuit for detecting a signal difference between first periodic signals generated at said output first and second electrodes of said second plate and generating an output signal;

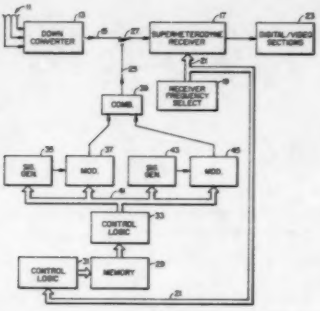
a second comparison circuit for detecting a signal difference between said first periodic signals generated at said output third and fourth electrodes of said second plate and generating an output signal;

a computing circuit for supplying second periodic signals opposite in phase to said input first and second electrodes of said first plate at predetermined intervals, detecting a phase difference between said second periodic signals and said first comparison circuit output signal to generate a first distance signal when said first comparison circuit output signal is reversed in phase, detecting a phase difference between said second periodic signals and said second comparison circuit output signal to generate a second distance signal when said second comparison circuit output signal is reversed in phase, and performing a logical operation on said first and second distance signals.

## 4,423,418
## SIMULATOR OF MULTIPLE ELECTROMAGNETIC SIGNAL SOURCES SUCH AS IN A RADAR SIGNAL FIELD

**Lester S. Pearlman, Sunnyvale, Calif., assignor to Itek Corporation, Sunnyvale, Calif.**

**Filed Jun. 18, 1981, Ser. No. 274,962**
**Int. Cl.³ G01S 7/40**
**U.S. Cl. 343—17.7** **13 Claims**




1. In combination:

an electromagnetic wave receiver of the type having a tuner in which a selected defined bandwidth is tunable over a broader frequency range;

memory means for storing the characteristics and frequencies of a plurality of different signals to be simulated within said frequency range;

control logic means responsive to the selected tuner center frequency and bandwidth for extracting from said memory only and all of the simulated signals that exist within a frequency window that is a fraction of said frequency range, said window surrounding said selected tuner center frequency and bandwidth;

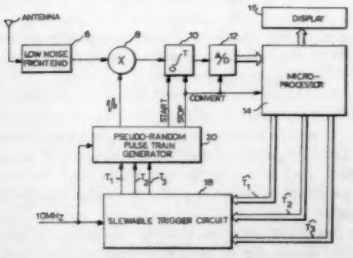
signal generating and modulating means responsive to said control logic means for generating only those simulated signals, if any, within said frequency window with their said characteristics and frequencies; and

combining means receiving said simulated signals from the means and delivering them ahead of said tuner.

## 4,423,419
## PULSED, PSEUDO RANDOM POSITION FIXING RADIO NAVIGATION METHOD AND SYSTEM AND THE LIKE

**Paul R. Johannessen, Lexington, Mass., assignor to Megapulse Incorporated, Lexington, Mass.**

**Filed Oct. 20, 1980, Ser. No. 198,547**
**Int. Cl.³ G01S 1/24**
**U.S. Cl. 343—387** **29 Claims**

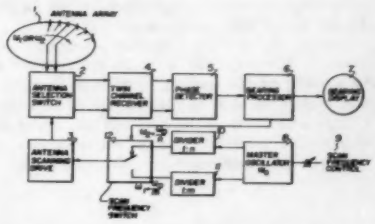



1. A method of rendering multi-station radio-frequency pulse navigation relatively insensitive to inband interference, that comprises, transmitting groups of radio-frequency pulses from each station with a group repetition rate selected to enable transmission of a pulse group from each station with sufficient time between each pulse group that signals from two or more of the stations cannot overlap in time anywhere in the navigation coverage area; pseudo-randomly pulse-position modulating pulses within groups in accordance with a predetermined code and over a sufficiently large number of groups to insure that the resulting pseudo-random pulse sequence contains a sufficiently large number of pulses that adequate skywave-groundwave rejection of the transmitted pulse groups occurs everywhere the same are received in said navigation coverage area.

## 4,423,420
## CANCELLATION OF GROUP DELAY ERROR BY DUAL SPEED OF ROTATION

**Zdzistaw A. A. Krajewski, Ajax, Canada, assignor to Bayly Engineering Limited, Ajax, Canada**

**Filed May 6, 1981, Ser. No. 261,286**
**Claims priority, application Canada, May 15, 1980, 352008**
**Int. Cl.³ G01S 1/44**
**U.S. Cl. 343—400** **7 Claims**




1. A radio direction finding method comprising scanning a circular antenna array alternately at first and second different angular velocities $\omega_1$ and $\omega_2$, scanning at angular velocity $\omega_1$ being done for m turns and scanning at angular velocity $\omega_2$ being done for n turns, the parameters m, n, $\omega_1$ and $\omega_2$ being related by the formulae

$$\omega_2/\omega_1 = m/n \quad (1)$$

and

$$n-m=1 \quad (2)$$

whereby a cancellation of group delay errors in receiving equipment connected to the antenna is obtained by computing the true bearing of a radio target from the formula

$$n\theta_2 - m\theta_1 = \theta \quad (3)$$

where $\theta_1$ and $\theta_2$ are radio target bearing readings obtained at the angular velocities $\omega_1$ and $\omega_2$ respectively and $\theta$ is the true bearing angle of said radio target.

**4,423,421**

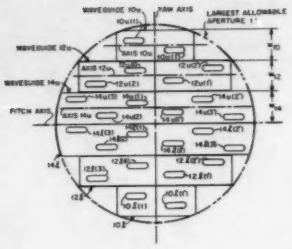
## SLOT ARRAY ANTENNA WITH AMPLITUDE TAPER ACROSS A SMALL CIRCULAR APERTURE

**George D. M. Peeler, Chelmsford; Chester J. Hunt, Melrose; Ninalbo G. DaMocogno, Winchester, and Richard J. Conti, Belmont, all of Mass., assignors to Raytheon Company, Lexington, Mass.**

**Continuation of Ser. No. 97,246, Nov. 26, 1979, abandoned. This application Dec. 21, 1981, Ser. No. 332,423**

**Int. Cl.³ H01Q *13/10***

**U.S. Cl. 343—771** **2 Claims**



1. In a linearly polarized slot array antenna having a substantially circular aperture, the ratio between the diameter of such aperture and the wavelength of radio frequency energy at the design frequency of such antenna being in the order of 5:1, the improvement comprising:

(a) a first plurality of rectangular waveguides, each one of such waveguides having a narrow wall and a broad wall, dimensioned, when juxtaposed with narrow walls abutting, substantially to cover a first half of the circular aperture, the width of the broad wall of each successive one of such waveguides decreasing outwardly from the centrally located one of such waveguides;

(b) a second plurality of rectangular waveguides similarly covering the second half of the circular aperture; and

(c) a plurality of radiating slots formed through the broad wall of each one of the rectangular waveguides, such slots being parallel one to another with the center of each different slot lying in a plane of maximum electric field within its corresponding rectangular waveguide.

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**4,423,422**

## DIAGONAL-CONICAL HORN-REFLECTOR ANTENNA

**Charles M. Knop, Lockport, and Edward L. Ostertag, New Lenox, both of Ill., assignors to Andrew Corporation, Orland Park, Ill.**

**Filed Aug. 10, 1981, Ser. No. 291,431**

**Int. Cl.³ H01Q *13/02***

**U.S. Cl. 343—786** **8 Claims**

1. A horn-reflector microwave antenna comprising

a reflector plate which is a section of a paraboloid,

a flared feed horn for supplying microwave signals to said reflector plate, said horn having an absorber-lined conical section forming a circular aperture at the wide end, which is the end closer to said reflector plate, and a pyramidal section forming a square aperture at the narrow end, which is the end farther away from said reflector plate, and

means for supplying microwave signals to said feed horn with the electric field extending along a diagonal of said square aperture, the combination of said pyramidal section

and said absorber-lined conical section producing substantially equal patterns in the E and H planes.

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**4,423,423**

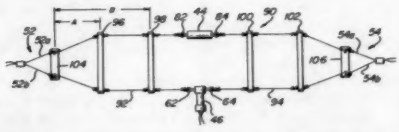
## BROAD BANDWIDTH FOLDED DIPOLE ANTENNA

**Elmer R. Bush, Bethlehem, Pa., assignor to L. Barker & Williamson, Inc., Bristol, Pa.**

**Continuation-in-part of Ser. No. 185,451, Sep. 9, 1980, abandoned. This application Aug. 31, 1981, Ser. No. 298,140**

**Int. Cl.³ H01Q *9/26***

**U.S. Cl. 343—803** **7 Claims**



1. A folded dipole antenna for use in the transmission and reception of radio frequency energy by a radio frequency generator capable of continuous operation over an entire extremely broad bandwidth while maintaining an effective radiated power factor and a voltage standing wave ratio of less than 2:1 for all frequencies over the entire operational bandwidth comprising:

(a) two conducting wires, each wire folded in spaced parallel relation to itself with like ends of each leg of said conducting wires being positioned in opposition to each other exhibiting an overall length proportional to the entire operational bandwidth;

(b) load balancing means electrically connecting one set of opposed ends of said wires;

(c) load matching means electrically connecting the remaining set of opposed ends of said wires by a single feed line to a radio frequency generator;

(d) said load balancing means and said load matching means requiring no variations of their electrical properties by any external means when tuning the radio frequency generator from one frequency to another frequency over the entire frequency spectrum of the antenna in order to maintain the substantially constant radiating characteristics of said antenna;

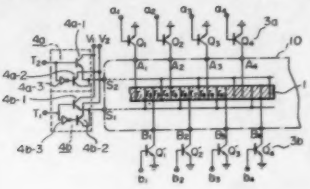
(e) the distal portion of each of the folded legs of the conducting wires tapering inward toward the other folded leg of the same conducting wire to a distance of one-half the spaced parallel distance between said folded legs over the remaining length of the antenna.

4,423,424

## THERMAL HEAD FOR FACSIMILE PRINTER

Shoichiro Takayama, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 327,211
Claims priority, application Japan, Dec. 8, 1980, 55/171995
Int. Cl.³ G01D 15/10
U.S. Cl. 346—76 PH 5 Claims



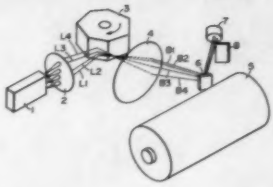
5. A thermal head for a facsimile printer comprising:
(a) a plurality of separated heater cells positioned in a straight line on a substrate;
(b) a plurality of group recognition lines;
(c) a plurality of input picture signal lines,
(d) wherein each of said group recognition lines and each of said input picture signal lines are directly connected to a plurality of said heater cells such that only a certain one of said group recognition lines and a certain one of said input picture signal lines are connected to oppcsite sides of a corresponding one of said heater cells; and wherein one of said group recognition lines and one of said input picture signal lines are coupled to a clamp voltage source.

4,423,426

## BEAM RECORDING APPARATUS

Takashi Kitamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 164,522, Jul. 2, 1980, abandoned. This application Jul. 6, 1982, Ser. No. 395,183
Claims priority, application Japan, Jul. 6, 1979, 54-85664
Int. Cl.³ G01D 15/14
U.S. Cl. 346—108 6 Claims



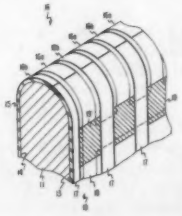
1. A beam recording apparatus, comprising:
beam generating means for generating plural beams; deflecting means for deflecting the plural beams generated by said beam generating means;
detecting means for simultaneously detecting said plural beams, deflected by said deflecting means, and for generating one detection signal;
synchronizing signal generating means for generating plural synchronizing signals, at a plurality of respective predetermined time intervals from generation of the detection signal, in response to generation of the detection signal by said detecting means; and
means for controlling the start of modulation of said plural beams respectively by said plural synchronizing signals.

4,423,425

## THERMAL PRINT HEAD HAVING GLAZED METAL SUBSTRATE

Dennis L. Reese, Rochester; John L. Regehr, Stewartville, both of Minn.; Albert E. Schierhorst, Boca Raton, Fla.; Ronald L. Soderstrom, Rochester, Minn., and James M. Thompson, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,439
Int. Cl.³ G01D 15/10
U.S. Cl. 346—76 PH 6 Claims



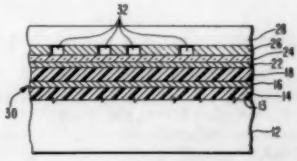
1. A thermal print head, comprising:
a substantially planar metal substrate having a rounded edge;
an insulating glaze on said substrate;
a plurality of thermal print elements disposed on said rounded edge; and
a plurality of conductive lands on said substrate and contacting each of said print elements.

4,423,427

## SUBSTRATE FOR OPTICAL RECORDING MEDIA AND INFORMATION RECORDS

Charlie J. Kaiser, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,739
Int. Cl.³ G01D 15/34
U.S. Cl. 346—135.1 10 Claims



1. A substrate suitable for optical recording comprising:
a base layer,
alternating layers overlying the base layer comprising two or more nonconformal coating layers overlying the base layer; and
a solvent barrier layer interposed between the nonconformal coating layers.

**4,423,428**

## PENCIL HEAD FOR AUTOMATIC DRAWING INSTRUMENT

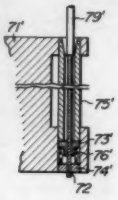
**Shigeo Kuwabara, No. 334-6, Fukaya, Ayase City, and Masanori Kamei, No. 937, Shobuzawa, Fujisawa City, both of Japan**

**Filed Oct. 27, 1980, Ser. No. 200,781**

**Claims priority, application Japan, Nov. 27, 1979, 54-163195[U]; Nov. 27, 1979, 54-163196[U]; Dec. 12, 1979, 54-160332**

**Int. Cl.³ G01D *15/16*; B43L *13/00***

**U.S. Cl. 346—139 C** **2 Claims**




1. A pencil head for an automatic drawing instrument wherein a plurality of pencil leads are employed as media for drawing, comprising:

a pencil head,

a rotatable pencil lead holding turret,

means for releasably mounting said turret on said head,

a plurality of vertical tubular members mounted on said turret, said tubular members being parallel to each other and each adapted to receive a pencil lead therein,

a plurality of resilient members carried by said turret, there being one resilient member for each tubular member, each resilient member being below the tubular member with which it is associated and being mounted in the turret for limited up-and-down movement, each resilient member having a vertical hole therethrough for grasping a pencil lead extending down through said hole,

means for individually, directly, and resiliently biasing each of said resilient members upwardly,

a rotating means,

an engagement means for engaging said rotating means with said turret for rotation of said turret by said rotating means to selectively dispose one of said tubular members at a drawing position,

a pencil lead pushing means disposed for up-and-down movement in the tubular member at said drawing position,

a driving means for moving said pencil lead pushing means downwardly in the tubular member at said drawing position to impose a downward pressure on a pencil lead in said tubular member and for moving said pencil lead pushing means upwardly in said tubular member to relieve said downward pressure.

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**4,423,429**

## WRITING MEDIUM UNIT FOR WRITING OR DRAWING MACHINES

**Hans-Dieter Rösel, Altdorf, Fed. Rep. of Germany, assignor to J.S. Staedtler K.G., Nuremberg, Fed. Rep. of Germany**

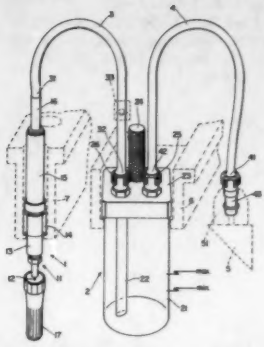
**Filed Nov. 2, 1981, Ser. No. 317,176**

**Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 8029188[U]**

**Int. Cl.³ G01D *15/16***

**U.S. Cl. 346—140 R** **9 Claims**

1. In a writing unit for a writing or drawing machine and the like having at least one writing unit head, at least one filling unit and a control unit, flexible writing medium supply tubes interconnecting a said filling unit with a said writing unit head and said control unit, means for detachably connecting said tubes to at least said filling units to facilitate the removal and connection of said units with respect to each other, and a mounting support having an opening therein and located on a said writing or drawing machine loosely receiving and supporting each said filling unit therein and each said filling unit



extending above and below the opening to permit ready removal of each said filling unit from the machine.

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**4,423,430**

## SUPERCONDUCTIVE LOGIC DEVICE

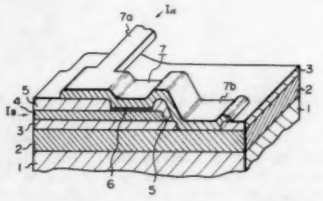
**Shinya Hasuo, and Hideo Suzuki, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Feb. 20, 1981, Ser. No. 236,579**

**Claims priority, application Japan, Feb. 20, 1980, 55-20214; Jul. 4, 1980, 55-91371; Jul. 4, 1980, 91372; Jul. 11, 1980, 55-94593; Jul. 15, 1980, 55-96390**

**Int. Cl.³ H01L *39/22, 27/12*; H03K *3/38***

**U.S. Cl. 357—5** **16 Claims**




1. A superconductive logic device comprising:

a superconductive ground plane;

a first insulating layer formed on said superconductive ground plane;

a superconductive base electrode, for receiving a bias current, formed on said first insulating layer;

second and third insulating layers formed on different portions of said superconductive base electrode, said second insulating layer being thicker than said third insulating layer;

a superconductive counter electrode formed on said second and third insulating layers;

a first superconductive counter electrode extension extending from said superconductive counter electrode and electrically connected to said superconductive ground plane; and

a second superconductive counter electrode extension extending from said superconductive counter electrode and serving as an input terminal for receiving an input signal current;

at least one Josephson junction being formed, said Josephson junction comprising said superconductive base electrode, said superconductive counter electrode and said third

insulating layer formed therebetween, the input signal current being supplied to said superconductive ground plane through said second superconductive counter electrode extension, said superconductive counter electrode and said first superconductive counter electrode extension, so as to apply a magnetic field to said at least one Josephson junction.

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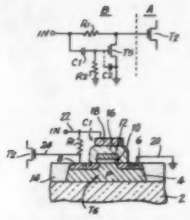
**4,423,431**

## SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE PROVIDING A PROTECTION CIRCUIT

**Nobuo Sasaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Dec. 24, 1980, Ser. No. 219,893**
**Claims priority, application Japan, Dec. 24, 1979, 54/167825**
**Int. Cl.³ H01L** *27/02, 29/78, 29/04*
**U.S. Cl. 357—41** **5 Claims**



1. A semiconductor integrated circuit device for protecting an element having an input gate electrode, said device comprising

a first resistor interposed between an input terminal and the input gate electrode of the element to be protected;

an MIS type transistor having an input gate electrode drain and source regions, one of said drain and source regions being connected to said input gate electrode of said element and the other of said drain and source regions being connected to ground;

a capacitor interposed between said input gate electrode of said MIS type transistor and said input terminal; and

one of a second resistor and a diode being interposed between and connected to said input gate electrode of said MIS type transistor and ground.

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**4,423,432**

## APPARATUS FOR DECODING MULTIPLE INPUT LINES

**Roger G. Stewart, Neshanic Station, N.J., and Moshe Mazin, Scotia, N.Y., assignors to RCA Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 116,204, Jan. 28, 1980, abandoned. This application Sep. 4, 1981, Ser. No. 299,791**
**Int. Cl.³ G11C** *11/40;* **H01L** *27/00*
**U.S. Cl. 357—45** **13 Claims**

1. Apparatus for selecting from multiple input lines comprising:

(a) a first plurality of substantially parallel input lines of a first conductivity type;

(b) a line selector comprising:

(i) a second plurality of substantially parallel conductive lines which are substantially perpendicular to said input lines, said second plurality of lines crossing over said input lines and being separated from said input lines by insulators at each intersection where one of said second plurality of lines crosses one of said input lines;

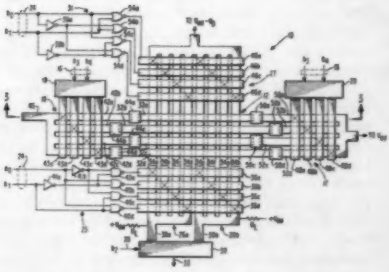
(ii) a single MOS transistor formed in each of said input lines in said line selector by reversing the conductivity type of each of said input lines beneath only a single one of said second plurality of substantially parallel lines, said single one of said second plurality of substantially parallel lines being the gate of said MOS transistor; and

(iii) at least one output line comprised of the junction of at least two of said input lines on the side of said MOS transistor opposite the side on which said input lines enter said line selector, whereby said line selector can receive said input lines on one side and select particular ones of said input lines for electrical connection to said at least one output line by appropriately biasing said conductive lines, whereby only selected ones of said MOS transistors are turned on thereby decoding said input lines for connection to said at least one output line;

(c) a line deselector comprising:

(i) a third plurality of substantially parallel conductive lines which are substantially perpendicular to said input lines, said third plurality of lines corresponding in number to said second plurality of lines and crossing over said input lines and being separated from said input lines by insulators at each intersection where one of said third plurality of lines crosses one of said input lines;

(ii) a single MOS transistor formed in each of said input lines in said line deselector by reversing the conductivity type of each of said input lines beneath only a single one of said second plurality of substantially parallel lines, said single one of said second plurality of substantially parallel lines being the gate of said MOS transistor, said MOS transistor being formed in a like position in the line selector and in the line deselector; and

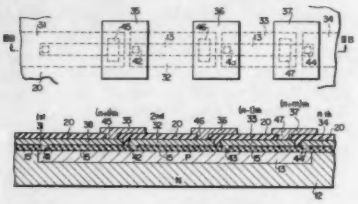


(iii) means for connecting a power supply to the junction of said input lines on the side of said MOS transistor opposite the side on which said input lines enter said line deselector, whereby said line deselector can receive said input lines on one side and select particular ones of said input lines for electrical connection to said means for connecting a power line by appropriately biasing said conductive lines, whereby only selected ones of said MOS transistors are turned on thereby decoding said input lines for connection to said means for connecting a power line said selection being such that for each input line only one MOS transistor, either in said line selector or in said line deselector, will be on whereby an input line will be connected either to said at least one output line or to said means for connecting a power supply.

## 4,423,433
## HIGH-BREAKDOWN-VOLTAGE RESISTANCE ELEMENT FOR INTEGRATED CIRCUIT WITH A PLURALITY OF MULTILAYER, OVERLAPPING ELECTRODES

**Ichiro Imaizumi, Tokyo; Shikayuki Ochi, Akishima; Masatoshi Kimura, Hachioji; Masayoshi Yoshimura, Hamuramachi; Takashi Yamaguchi, Tachikawa, and Toyomasa Koda, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jun. 3, 1980, Ser. No. 156,015**
**Claims priority, application Japan, Jun. 4, 1979, 54-68972**
**Int. Cl.³ H01L *27/02***
**U.S. Cl. 357—51** **11 Claims**



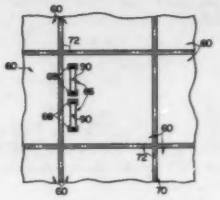
1. A high-breakdown-voltage resistance element comprising a semiconductor body, an impurity layer disposed in a surface region of said semiconductor body to provide a resistor body, and n first layer electrodes (n: a positive integer) connected to said resistor body through corresponding contact holes in a first insulating film formed on the surface of said semiconductor body, said n first layer electrodes being arranged in such a relation that the 1st electrode of said n first layer electrodes is connected to one end of said resistor body, the 2nd to (n−1)th electrodes of said n first layer electrodes are connected to intermediate portions of said resistor body, and the n-th electrode of said n first layer electrodes is connected to the other end of said resistor body, said n electrodes of said n first layer electrodes being separated from one another by predetermined spaces along said first insulating film so that said n electrodes do not contact one another and so that a plurality of regions of said resistor body are left uncovered by said n first layer electrodes, said resistance element further comprising a second insulating film formed on said 1st to n-th electrodes of said n first layer electrodes, and m second layer electrodes (m: a positive integer smaller than n) comprising (n+1)th electrodes deposited on said second insulating film and connected to selected ones respectively of said 1st to (n−1)th electrodes among said n first layer electrodes, said m second layer electrodes covering said plurality of regions of said resistor body which are uncovered by said n electrodes of said first layer electrodes so that said 1st to (n+m)th electrodes cover a surface region including the entire surface of said resistor body and areas of said semiconductor body adjacent thereto.

## 4,423,434
## SEMICONDUCTOR DEVICE HAVING TWO OR MORE SEMICONDUCTOR ELEMENTS WITH PAIRED CHARACTERISTICS REGULARLY ARRANGED IN A SEMICONDUCTOR SUBSTRATE

**Shigeru Komatsu, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Dec. 3, 1980, Ser. No. 212,503**
**Claims priority, application Japan, Dec. 19, 1979, 54-165390**
**Int. Cl.³ H01L *27/02, 29/84, 29/04, 23/28***
**U.S. Cl. 357—51** **4 Claims**

1. In a semiconductor device, the improvement comprising:
a semiconductor substrate;
at least two semiconductor elements with paired characteristics disposed equidistantly from an edge of said semiconductor substrate with the same orientation with respect to each other in said semiconductor substrate, wherein said semiconductor elements are disposed within an area defined by said edge of said semiconductor substrate and by

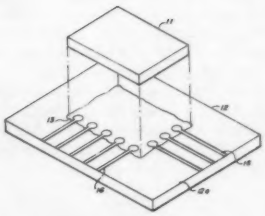


a line which is separated from said edge by a distance 1.8 times the thickness of said semiconductor substrate or less.

## 4,423,435
## ASSEMBLY OF AN ELECTRONIC DEVICE ON AN INSULATIVE SUBSTRATE

**Howard R. Test, II, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Oct. 27, 1980, Ser. No. 200,740**
**Int. Cl.³ H01L *23/48***
**U.S. Cl. 357—65** **10 Claims**

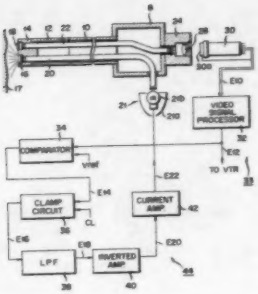


1. An electronic device package comprising:
(a) an insulative substrate having a plurality of electrical conductors on a major surface thereof;
(b) an electronic device having electrical connector means on a major surface thereof for electrically connecting said electronic device to an external electrical component, said electronic device being mounted on said substrate so that said major surface of said device is in facing relationship with said major surface of said substrate and said electrical connector means is in registration with selected ones of said electrical conductors; and
(c) a bonding material interposed between said major surfaces for mechanically bonding said electronic device to said substrate, said bonding material further disposed along the perimeter of said electronic device to form a protective seal between said electronic device and said insulative substrate, and said bonding material being substantially electrically conductive only along an axis which is orthogonal to said major surfaces to form an electrically conductive path between said electrical connector means and said electrical conductors.

## 4,423,436
## IMAGE PICKUP APPARATUS

Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 4, 1981, Ser. No. 260,299
Claims priority, application Japan, May 9, 1980, 55-61347
Int. Cl.³ H04N 5/19
U.S. Cl. 358—98 5 Claims

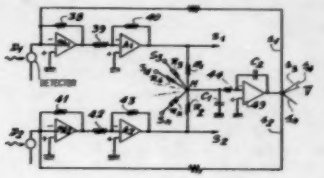



1. An image pickup apparatus which comprises:
light source means for providing an illumination light;
an endoscope including illumination means coupled to said light source means for transmitting the illumination light from said light source means to a foreground subject to be illuminated; and image transmission means for sensing an optical image of the foreground subject illuminated by said illumination means and for transmitting the optical image;
image signal conversion means coupled to said image transmission means of said endoscope for converting the optical image into a video signal;
clamp means coupled to said image signal conversion means for clamping the black level of said video signal to provide a clamped signal; and
integrator means coupled to said clamp means and to said light source means for integrating said clamped signal to continuously provide averaged information of said video signal to said light source means to continuously set the amount of illumination light provided by said light source means in accordance with said averaged information;
said light source means, illumination means, image transmission means, image signal conversion means, clamp means and integrator means jointly comprising an automatic level control loop which is continuously actuated so at to continuously set amount of illumination light in accordance with said averaged information to cause said video signal to be at a substantially constant prescribed level;
said automatic level control loop further comprising comparator means coupling said image signal conversion means to said clamp means for comparing the level of the video signal with that of a reference potential and for generating an output signal when the video signal reaches a level corresponding to the reference potential; and
said clamp means clamping said output signal of said comparator means at a prescribed level and at a predetermined timing.

## 4,423,437
## OPTOELECTRONIC DEVICE FOR VIDEOFREQUENCY SCANNING OF IMAGES

Jean L. Beck; Jean F. Le Bars; Yves A. Emmanuelli, and Denis Bargues, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 14, 1981, Ser. No. 311,407
Claims priority, application France, Oct. 17, 1980, 80 22275
Int. Cl.³ H04N 7/18
U.S. Cl. 358—113 8 Claims



1. An optoelectronic device for scanning videofrequency images comprising an optical element driven in such a manner as to produce an image scan, an optical element for focusing on a detection system comprising at least one array of detectors, and videofrequency means for processing detailed signals comprising in particular circuits for amplifying the respective detected signals and a correcting unit, wherein each amplifying circuit is connected to the corresponding detector by means of a direct-current coupling and said correcting unit is formed by a so-called occultation device having two states for producing a uniform flux on all the detectors during an initialization stage and in the first state instead of the reception flux corresponding to the videofrequency image and conversely in the second state, and a correction loop comprising:
a storage memory for storing the values of the signals present at the output of said amplifying circuits when the occultation device is in the first state;
a first circuit for subtracting respectively said stored values from those present at the output of the respective amplifying circuits in order to compensate for the drift aforesaid;
a measuring circuit for producing the mean value of the amplified videofrequency signals;
a second circuit for subtracting said mean value from the signal of each detector.

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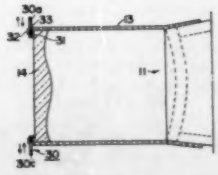
## 4,423,438
## PROJECTION TYPE CATHODE RAY TUBE WITH MASKING MEANS

Yoshitaka Nakamura, Otsu, Japan, assignor to NEC Kansai, Ltd., Otsu, Japan

Filed Jan. 11, 1982, Ser. No. 338,205
Claims priority, application Japan, Feb. 26, 1981, 56/27046[U]; Feb. 28, 1981, 56/28668
Int. Cl.³ H04N 5/74, 9/31
U.S. Cl. 358—231 10 Claims



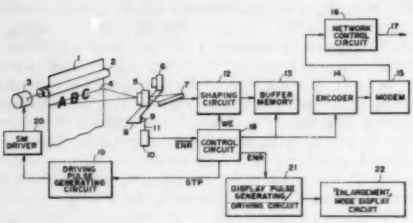
1. In a projection cathode ray tube including a convex target formed on a face plate, a concave mirror formed on an end plate, said target and said mirror being provided with the same

center of curvature and arrangement to reflect light of an image on said target with said mirror, and a spherical aberration correcting means secured in front of said face plate, the improvement wherein said correcting means comprises a correction lens member for correcting spherical aberration and a masking member in the form of a movable masking ring for removing a reflected light ray by shielding a partial portion of said correction lens member, said movable masking ring having an eccentric aperture and means movably securing said movable masking ring only to a partial predetermined area of said correction lens member so as to improve the resolution of a projected image on a screen.

## 4,423,439
## FACSIMILE TRANSMITTER

**Asao Watanabe, Higashikurume, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 18, 1982, Ser. No. 350,060**
**Claims priority, application Japan, Mar. 3, 1981, 56-29394; Mar. 3, 1981, 56-29395**
**Int. Cl.³ H04N *1/24, 1/12***
**U.S. Cl. 358—287** **21 Claims**




1. A facsimile transmitter, comprising:

image-taking means for scanning image information in an original along a principal scanning direction to convert said information into electric signals;

original displacing means for displacing said original in an auxiliary scanning direction substantially perpendicular to said principal scanning direction;

image-forming means for focusing an optical image with one of plural image sizes on said image-taking means in order to obtain image signals for an equal-size image or a modified-size image of the information on said original from said image-taking means;

image size detecting means for detecting information corresponding to the image size of the optical image focused on said image-taking means upon detection of whether said image-forming means is in one position or is in another position; and

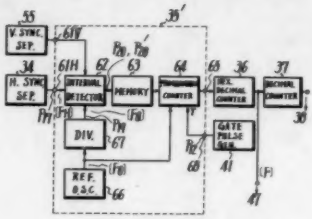
control means for controlling the amount of displacement of said original by said original displacing means in response to the detection by said size detecting means.

## 4,423,440
## CODE SIGNAL READING APPARATUS

**Katsuichi Tachi, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Continuation-in-part of Ser. No. 47,765, Jun. 12, 1979, abandoned. This application Sep. 15, 1981, Ser. No. 302,607**
**Claims priority, application Japan, Jun. 19, 1978, 53-73979**
**Int. Cl.³ H04N *5/76***
**U.S. Cl. 358—335** **4 Claims**

1. In a code signal reading apparatus for reading a code signal from a video signal reproduced from a recording medium on which said video signal is recorded so as to form one recording track at every field or at every frame with said code signal formed by pulse-modulating a reference clock pulse for indicating an absolute address being inserted in a predetermined interval of a field period, a variable oscillator source comprising a reference oscillator, a programmable frequency divider connected to the output of said reference oscillator for frequency-dividing the output signal, a time width detector circuit detecting the time width of a specific interval of said reproduced video signal and comprising a first gate receiving horizontal and vertical sync signals, a flip-flop connected to the output of said first gate and producing a pair of out-of-phase signals, a first counter connected to the output of said

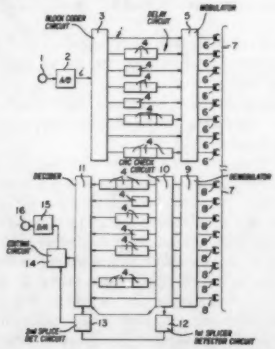



programmable divider and said flip-flop, first and second buffers connected to the output of said first counter and receiving said pair of signals from said flip-flop, a comparator connected to the outputs of said first and second buffers and receiving an input from said flip-flop, and a second programmable counter receiving the output of said comparator and receiving an output from said programmable divider and producing the output of said variable oscillator source.

## 4,423,441
## PCM RECORD REPRODUCER

**Minoru Ozaki, Amagasaki; Ken Onishi, Kohriyama, and Kunimaro Tanaka, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 28, 1980, Ser. No. 182,055**
**Claims priority, application Japan, Aug. 30, 1979, 54-111193; Sep. 17, 1979, 54-119525**
**Int. Cl.³ G11B *27/02, 5/00***
**U.S. Cl. 360—13** **6 Claims**




1. A PCM record reproducer which comprises a coder circuit for forming PCM signals by adding error detection codes to data signals in a predetermined pattern prior to recording on a magnetic tape; a splice detection circuit for determining a splice point of the magnetic tape by finding inconsistency between the detected error detection codes depending upon evaluation of said PCM signals read-out from said magnetic tape in which said PCM signals are recorded; and an editing circuit for editing said PCM signals when the splice point is determined by said splice detector circuit;

wherein said coder circuit has a structure for adding two or

more kinds of error detection codes to said data signals; and said splice detector circuit has a structure for determining the splice point of said magnetic tape, at a time indicated by at least one inconsistency of the detected result of two or more kinds of said error detection codes.

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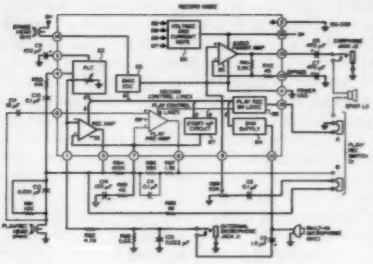
**4,423,442**

## TAPE RECORDER UTILIZING AN INTEGRATED CIRCUIT

**Ricky F. Bitting, N. Syracuse, and Roland M. Marion, Lafayette, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.**

**Filed Dec. 31, 1981, Ser. No. 336,326**
**Int. Cl.³ G11B 5/02**
**U.S. Cl. 360—68** **21 Claims**



1. An integrated circuit for use in a tape recorder comprising:

(1) first and second terminals for connection to a dc source, the second terminal being common,

(2) first amplifying means activatable upon the supply of current thereto, for recording an audio signal, having

(a) a first, non-inverting input terminal for connection to a microphone,

(b) a second, inverting input terminal for connection to a feedback network,

(c) an output terminal for connection to a recording head, and

(d) a first control connection means for activating said first amplifying means when current is supplied thereto.

(3) second amplifying means activatable upon the supply of current thereto, for amplifying an audio signal, having

(a) a first, non-inverting input terminal for connection to a playback head,

(b) a second, inverting input terminal for connection to a feedback network,

(c) an output terminal and

(d) a second control connection means for activating said second amplifying means when current is supplied thereto.

(4) a first current mirror including a first current reference and a first current source referenced thereto, both connected to said first source terminal, the output of said first current source being connected to said first control connection means,

(5) a second current mirror including a second current reference and a second current source referenced thereto, both connected to said first source terminal, the output of said second current source being connected to said second control connection means,

(6) a first differentially connected transistor pair, each transistor thereof having base, emitter and collector electrodes, the collector of a first transistor of said pair being serially connected via said first current reference to said first source terminal and the collector of a second transistor of said pair being serially connected via said second current reference to said first source terminal,

(7) a third, current sink transistor having base emitter and collector electrodes, the collector thereof connected to the emitters of said differential transistor pair and the emitter thereof connected to said second source terminal via a first current setting resistor,

(8) a control terminal for controlling the potential of a base of said transistor pair to select which transistor of said pair is conductive, and thereby whether said first or said second amplifying means is active, and

(9) means connected to said first and second source terminals for applying a temperature compensated voltage across said current setting resistor for temperature compensating the current in said current references, and said current sources referenced thereto.

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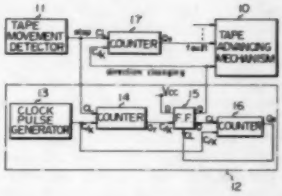
**4,423,443**

## AUTOMATIC-REVERSING TAPE DECK

**Yoshiharu Ueki, and Shouzaburou Sakaguchi, both of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Sep. 28, 1981, Ser. No. 306,398**
**Claims priority, application Japan, Sep. 29, 1980, 55-135618**
**Int. Cl.³ G11B 15/48, 17/00, 19/02, 15/18**
**U.S. Cl. 360—74.1** **2 Claims**




1. In an automatic-reversing tape deck arranged wherein the magnetic tape advancing direction is automatically reversed when the tape is wholly wound during operation and then the operation is continued with the tape being advanced in the reversed direction, which comprises:

(a) a tape advancing mechanism adapted to advance a magnetic tape in the tape deck in the forward and backward directions, said tape advancing mechanism being further adapted to change the tape advancing direction from one of said forward and backward directions to the other in response to a direction changing command signal;

(b) first means for detecting the movement of the magnetic tape and producing a stop detection signal when the magnetic tape stops;

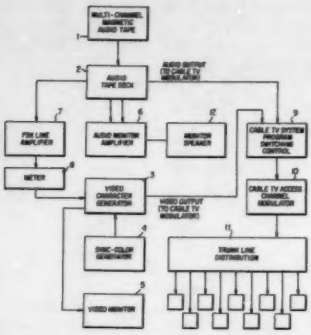
(c) second means adapted to be activated by said stop detection signal for producing said direction changing command signals repeatedly at a predetermined repetition period as long as said stop detection signal lasts; wherein the improvement comprises:

a counter adapted to be activated by said stop detection signal thereby to count said direction changing signals as long as said stop detection signal lasts for producing said fault detection signal when it counts a predetermined number of said direction changing signals, whereby said fault detection signal causes said tape advancing mechanism to stop the tape advancing mechanism after a certain number of direction changes.

## 4,423,444
## METHOD FOR RECORDING A MAGNETIC AUDIO TAPE AND APPARATUS FOR GENERATING A TELEVISION SIGNAL FROM THE RECORDED MAGNETIC AUDIO TAPE

John L. Humphreys, 12048 Greywing Sq., Reston, Va. 22091

Filed Jun. 30, 1981, Ser. No. 279,190
Int. Cl.³ G11B *31/00*
U.S. Cl. 360—79 9 Claims



1. An apparatus for generating a television signal including a discrete electronic audio signal in synchronization with a discrete electronic video signal comprising:

(a) a magnetic audio tape having a first track of digital information and a second track of audio information, said first track in synchronization with said second track;

(b) an audio tape deck means adjacent said tape for reading the first track of digital information and converting the digital information into a corresponding digital electronic signal and for simultaneously reading the second track of audio information and converting the audio information into the discrete electronic audio output; and

(c) a video character generation means having an input for receiving the digital electronic signal, said video character generation means converting said digital electronic signal into the discrete video signal, said discrete electronic audio output comprising sounds from a human voice and said discrete video signal comprising a visualization in character form of said human voice sounds.

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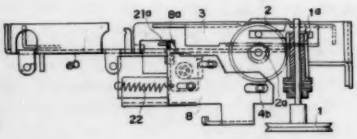
## 4,423,445
## CLUTCH SYSTEM IN A TAPE PLAYER

Hitoshi Okada; Kazuki Takai, and Katsumi Yamaguchi, all of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed May 1, 1981, Ser. No. 259,745
Claims priority, application Japan, May 2, 1980, 55-59858[U]
Int. Cl.³ G11B *5/008*
U.S. Cl. 360—96.5 8 Claims



1. A cassette tape playing apparatus, comprising: receiving means for receiving a cassette inserted in said tape playing apparatus; a drive motor; first coupling means for operatively coupling said drive motor to a cassette in said receiving means to effect movement of a tape in the cassette; a tape head supported for movement relative to said receiving means between a first position spaced from a cassette therein and a second position engaging the tape in a cassette therein; first and second rotors supported for rotation independently of each other about a common axis and supported for relative axial movement between a third position in which said rotors are spaced from each other and a fourth position in which said rotors are located adjacent each other; second coupling means for drivingly coupling said drive motor to said first rotor; cooperating means on said first and second rotors for releasably locking them against relative rotation in said fourth position thereof; an operating member supported for movement between a fifth position and a sixth position; second coupling means operatively coupling said operating member and said tape head for effecting movement of said tape head from said first position to said second position in response to movement of said operating member from said fifth position to said sixth position; first actuating means responsive to said operating member for placing said first and second rotors in said fourth position when said operating member is in said fifth position and in said third position when said operating member is in said sixth position; second actuating means operatively coupling said second rotor to said operating member for effecting movement of said operating member from said fifth position to said sixth position in response to rotation of said second rotor; and switch means for actuating said drive motor in response to insertion of a cassette into said receiving means; whereby when said tape head, said rotors and said operating member are in said first, fourth, and fifth positions, respectively, and a cassette is inserted in said receiving means, said switch means actuates said driving motor which in turn effects rotation of said first and second rotors, causing said operating member to move from said fifth position to said sixth position and to move tape head from said first to said second position, said first actuating means moving said rotors to said third position when said operating member is moved to said sixth position, thereby disengaging said second rotor from said first rotor and drive motor.

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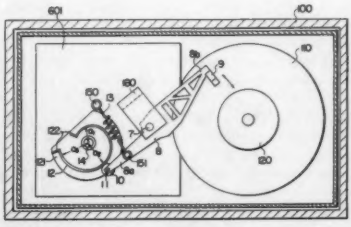
## 4,423,446
## MAGNETIC DATA RECORDING AND READING DEVICE WITH MAGNETIC HEAD POSITIONING MECHANISM

Tuyoshi Takahashi, Odawara; Hiroshi Nishida, Kanagawa, and Toshio Shiono, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 4, 1981, Ser. No. 240,560
Claims priority, application Japan, Mar. 5, 1980, 55-26558
Int. Cl.³ G11B *21/08*
U.S. Cl. 360—106 6 Claims



1. A magnetic data recording and reading device for a magnetic disc memory device comprising:

a magnetic head to be positioned on a magnetic disc for effecting magnetic recording and reading of data, the magnetic disc being arranged to rotate about a first axis;

a cam rotatable about a second axis which is substantially parallel to said first axis, said cam being provided with a discontinuous spiral outer cam surface terminating in two opposite ends;

a pivotal arm supporting said magnetic head at one end

thereof and contact means at the opposite end thereof, said contact means being adapted to contact said cam surface;
pivot means supporting said pivotal arm at a portion between said one end and said opposite end for pivotal movement of said pivotal arm about a third axis substantially parallel to said first axis;
means for biasing said pivotal arm so that said contact means is kept in contact with said cam surface, said contact means being adapted to cooperate with each of the ends of said cam surface for positively limiting excursion of said magnetic head across the magnetic disc; and
a motor for rotating said cam about said second axis, whereby rotation of said cam pivotally moves said pivotal arm to thereby move said magnetic head across the magnetic disc.

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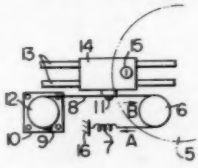
**4,423,447**

## HEAD POSITIONING MECHANISM FOR MAGNETIC DISC MEMORY DEVICE

**Hiroshi Nishida, Kanagawa; Tuyoshi Takahashi; Toshio Shiono, both of Odawara, and Kiyomitsu Ohtsuka, Atami, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Mar. 24, 1981, Ser. No. 247,053**
**Claims priority, application Japan, Mar. 24, 1980, 55-36108**
**Int. Cl.³ G11B *5/48, 5/54***
**U.S. Cl. 360—106** **5 Claims**




1. A magnetic head positioning mechanism for positioning a magnetic head carried on a carriage at a track on a magnetic disc installed on a base, comprising:
a carriage for carrying said magnetic head;
guide rail means for supporting said carriage such that it is rectilinearly movable along said guide rail means;
a belt partially mounted to said carriage;
a motor pulley for winding or unwinding a first end portion of said belt;
a step motor coupled with said motor pulley to drive said motor pulley in forward and reverse directions of rotation;
a pin fixed to said base in a direction of extension of a second end portion of said belt; and
pulling means connecting the second end portion of said belt with said pin for applying a rotational torque with a fixed direction to said motor under all conditions in a manner so as to avoid occurrence of an inherent step motor magnetic hysteresis phenomenon, by pulling said first end of said belt in a direction opposite to a winding direction of said motor pulley.

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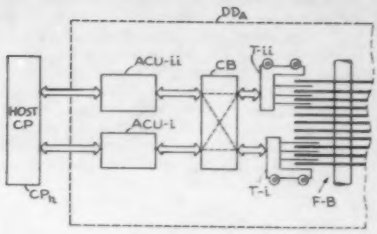
**4,423,448**

## MULTI-PATH TO DATA FACILITY FOR DISK DRIVE TRANSDUCER ARMS

**Jorgen Frandsen, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.**

**Continuation-in-part of Ser. No. 106,847, Dec. 26, 1979, Pat. No. 4,331,990, Division of Ser. No. 85,945, Oct. 18, 1979, abandoned. This application Jun. 4, 1981, Ser. No. 270,653**
**Int. Cl.³ G11B *5/54, 21/08***
**U.S. Cl. 360—106** **18 Claims**

1. An improved disk drive arrangement arranged to be controlled by one or more computer means and including a disk file, this file being characterized by two or more transducer arrays with each array coupled in a respective electronic data channel to at least part of said computer means via an associated control stage, the improvement therein comprising:
cross-bar means coupled between each said transducer means and all of the control stages, and adapted to inter-couple each transducer means with an associated respective control




stage in a first "normal" mode while also being adapted to couple each said transducer means to at least one other control stage in an "emergency mode";
whereby this system is arranged so that if one of the said electronic data channels to the computer means is interrupted it may be reconfigured along an alternate "emergency path" by said cross-bar means, to thus afford a "soft failure" and "alternate path to data" capability in the arrangement.

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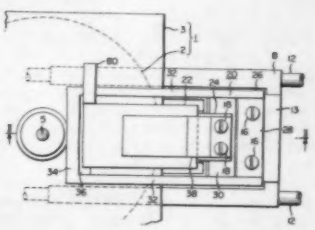
**4,423,449**

## MOVABLE MAGNETIC HEAD BLOCK ASSEMBLY FOR A DOUBLE SIDED FLEXIBLE DISK STORAGE DEVICE

**Tadashi Hasegawa, Chigasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 12, 1981, Ser. No. 292,182**
**Claims priority, application Japan, Oct. 9, 1980, 55-141548**
**Int. Cl.³ G11B *5/54, 5/48***
**U.S. Cl. 360—106** **6 Claims**




1. A movable magnetic head block assembly for a double sided flexible magnetic disk storage device comprising:
an electromagentic transducer head assembly comprising a pair of mutually opposed magnetic disk contacting surfaces which contact substantially directly opposite portions of the opposite surfaces of said magnetic disk such that a balanced tracking pressure is brought to bear on each side of the disk, at least one of said contacting surfaces including an electromagnetic transducer head operative with the magnetic disk on the adjacent side;
at least one retractable support arm assembly for respectively retractably supporting said at least one contacting surface including the electromagnetic transducer head, said support arm assembly including a support arm on which said head is resiliently mounted, an anchor member having sufficient rigidity to resist plastic deformation, and flexible leaf spring means mechanically rigidly fixed at one end to said support arm and at the other end to said anchor

member for causing said support arm to be normally urged in the direction towards the surface of said magnetic disk and to be retractable against the pressure of said leaf spring means about a point of flexure in said leaf spring means;

a rigid carriage means movable in a radial direction with respect to said magnetic disk and having a fixed stop thereon against which said support arm abuts when urged towards the surface of said magnetic disk;

said anchor member of said at least one support arm assembly being a separate member from said carriage; and

means mechanically rigidly securing said anchor member to said carriage and releasable for permitting adjustment of said anchor member relative to said carriage, whereby the position of the contacting surface supported on said support arm can be adjusted and set at least prior to mechanically rigidly securing said anchor means to said carriage, by adjusting the position of the assembled support arm assembly in relation to the carriage.

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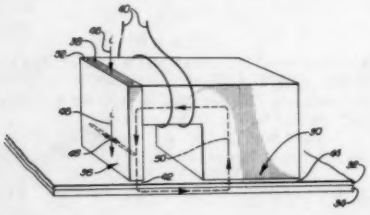
**4,423,450**

## MAGNETIC HEAD AND MULTITRACK TRANSDUCER FOR PERPENDICULAR RECORDING AND METHOD FOR FABRICATING

**Harold J. Hamilton, Sylmar, Calif., assignor to Censtor Corporation, San Jose, Calif.**

**Filed May 6, 1981, Ser. No. 260,899**
**Int. Cl.³ G11B *5/20***
**U.S. Cl. 360—111** **37 Claims**



1. A transducer in cooperative relationship with a magnetic media for writing thereof and reading therefrom comprising:

a magnetic path constructed for perpendicular recording and reproduction on and from the magnetic media,

said magnetic path being constructed of a magnetic material having a high permeability and a low reluctance which facilitates the efficient passage of magnetic flux through said magnetic path, and

a flux gate means coupled to said magnetic path for selectively creating a magnetic field in said magnetic path during either reading or writing which in effect increases the reluctance of the magnetic path to prevent the effective passage of magnetic flux therethrough whereby said magnetic path for perpendicular recording and reproduction can be closed and opened.

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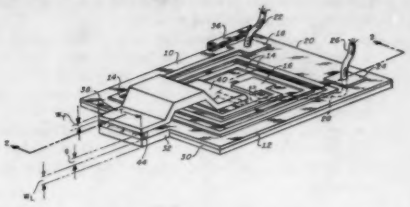
**4,423,451**

## THIN FILM MAGNETIC HEAD HAVING DISPARATE POLES FOR PULSE ASYMMETRY COMPENSATION

**Chao S. Chi, Shrewsbury, Mass., assignor to Sperry Corporation, New York, N.Y.**

**Filed Aug. 10, 1981, Ser. No. 291,208**
**Int. Cl.³ G11B *5/12, 5/27, 5/28, 5/30***
**U.S. Cl. 360—125** **8 Claims**

1. A thin film transducer for magnetically recording on a recording medium, comprising a substrate of soft magnetic material, said substrate further comprising first and second thin-film non-saturated pole members, spaced apart from each other to define a gap therebetween and coupled to inductive coil means for magnetically coupling a signal to said pole members, each pole member having a surface, in use, disposed adjacent said recording medium, said pole surfaces having a spatial disparity with respect to each other and with respect to



said recording medium, so constructed and arranged to substantially compensate for nonlinear recording properties of said medium.

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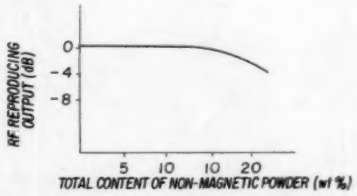
**4,423,452**

## MAGNETIC RECORDING MEDIUM

**Norifumi Kajimoto; Yoshio Kawakami, and Kinji Sasaki, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan**

**Filed Jul. 8, 1981, Ser. No. 281,397**
**Int. Cl.³ G11B *5/62***
**U.S. Cl. 360—131** **5 Claims**




1. A magnetic recording medium which comprises a substrate coated with a magnetic layer comprising a magnetic powder and a fine titanium oxide powder having a particle diameter of at least 0.4μ and at least one other fine hard non-magnetic powder.

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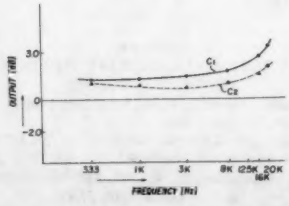
**4,423,453**

## MAGNETIC RECORDING MEDIUM

**Hiroshi Kawahara; Hitoshi Azegami, and Eiji Horigome, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan**

**Filed Jul. 13, 1981, Ser. No. 283,099**
**Claims priority, application Japan, Jul. 31, 1980, 55-105657**
**Int. Cl.³ G11B *23/00;* B32B *7/02***
**U.S. Cl. 360—131** **2 Claims**




1. In a magnetic recording medium having two coated mag-

netic layers of a first magnetic layer and a second magnetic layer on a non-magnetic substrate, an improvement characterized in that said first magnetic layer has a coercive force of 400 to 590 Oe and a thickness of 2.1 to 2.8μ and said second magnetic layer has a coercive force of 590 to 800 Oe and a thickness of at least 2.1μ.

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**4,423,454**

**MAGNETIC RECORDING DISK**

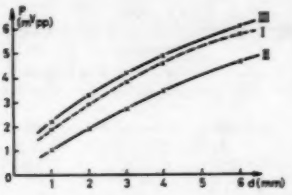
**Peter Felleisen, Lampertheim; Dieter Mayer, Ludwigshafen; Eberhard Koester, Frankenthal; Friedrich Domas, Altlussheim, and Paul Deigner, Willstaett, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Jun. 26, 1980, Ser. No. 163,400**

**Claims priority, application Fed. Rep. of Germany, Jul. 12, 1979, 2928096**

**Int. Cl.³ G11B** *5/70, 5/82*

**U.S. Cl. 360—135** **3 Claims**




1. A magnetic recording disk comprising a non-magnetic substrate and at least two firmly adhering magnetizable layers applied to one or both sides thereof, wherein the layer located directly on the substrate is magnetically isotropic and exhibits a random orientation with no magnetic preferred direction, whilst the second layer exhibits orientation of the anisotropic magnetic particles parallel to the substrate and parallel to the envisaged recording direction, such that relatively low frequency signals are magnetically, longitudinally stored predominantly within the isotropic layer whereas relatively high frequency signals are magnetically, longitudinally stored predominantly within the anisotropic layer.

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**4,423,455**

**TAPE COUNTER FOR MULTISPEED TAPE RECORDER/PLAYER**

**Norio Fukuoka, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Aug. 7, 1981, Ser. No. 290,875**

**Claims priority, application Japan, Aug. 22, 1980, 55-118772[U]**

**Int. Cl.³ G11B** *27/34*

**U.S. Cl. 360—137** **8 Claims**

1. A tape counter for a multispeed tape recorder/player, comprising:

tape transport means for transporting a tape at at least two different tape speeds;

tape speed selecting means coupled to said tape transport means for selecting one of said at least two different tape speeds;

tape running detecting means coupled to said tape transport means and to said tape speed selecting means for providing count signals with the running of said tape, the frequency of said count signals being changed at a rate corresponding to a tape speed selected by said tape speed selecting means, whereby the repetitive number of said count signals supplied during a time period that said tape runs for a given period of time is substantially constant irrespective of the tape speed selected by said tape speed selecting means;

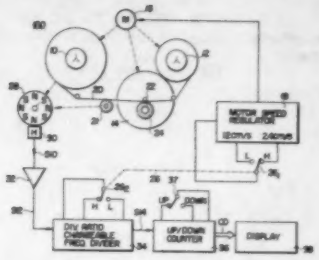
said tape running detecting means including:

a detector for generating first signals indicating the running of said tape;

a variable frequency converter coupled to said detector, for frequency converting said first signals;

one of at least two given frequency converting rates for thereby providing said count signals; and

a converting ratio designating switch coupled to said tape




speed selecting means and to said frequency converter for designating one of said given frequency converting rates of said frequency converter responsive to the tape speed selected by said tape speed selecting means;

counter means coupled to said frequency converter of said tape running detecting means for counting said count signals to provide count data; and

display means coupled to said counter means for displaying information corresponding to said count data.

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**4,423,456**

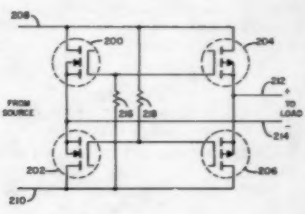
**BATTERY REVERSAL PROTECTION**

**Gary A. Zaideneweber, St. Paul, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.**

**Filed Nov. 13, 1981, Ser. No. 321,037**

**Int. Cl.³ H02H** *9/00*

**U.S. Cl. 361—77** **1 Claim**




1. A polarity reversal protection circuit connectable between a pair of source lines and a pair of load lines comprising:

first and second field-effect transistors of a first channel type having their source-drain paths connected in series across said source lines; and,

third and fourth field-effect transistors of a second channel type having their source-drain paths connected in series across said source lines and in parallel with the source-drain paths of said first and second transistors; and,

wherein the gate electrodes of said first and third transistors are directly coupled together and to only one of said source lines and the gate electrodes of said second and fourth transistors are directly coupled together and to only the other of said source lines; and,

one of said load lines is connected to the junction point of the drains of said first and second transistors; and,

the other of said load lines is connected to the junction point of the drains of said third and fourth transistors.

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**4,423,457**

## OVERLOAD PROTECTION CIRCUIT FOR A SEMICONDUCTOR SWITCH

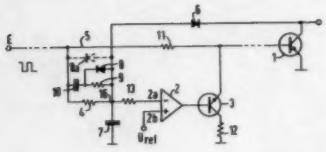
**Antonio Brajder, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany**

**Filed Jan. 29, 1982, Ser. No. 343,966**

**Claims priority, application Fed. Rep. of Germany, Feb. 5, 1981, 3104015**

**Int. Cl.³ H02H *3/26***

**U.S. Cl. 361—86** **2 Claims**



1. An overload protection circuit for a semiconductor switch, the semiconductor switch having a control input, a connection to ground, and a third lead, the overload protection circuit comprising:

a control line coupled to the control input of the semiconductor switch;

a transistor having a base and a collector-emitter path coupled between the control line and ground;

a comparison stage for detecting an overload, the comparison stage having a first input, a second input and an output, the first input of the comparison stage being coupled via a resistor to the control line of the semiconductor switch, via a diode to the third lead of the semiconductor switch, and via a first capacitor to ground; the second input of the comparison stage being coupled to a reference voltage; and the output of the comparison stage being coupled to the base of the transistor; and

a shunt circuit having a second diode coupled across the resistor, the cathode of the second diode coupled to the control line.

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**4,423,458**

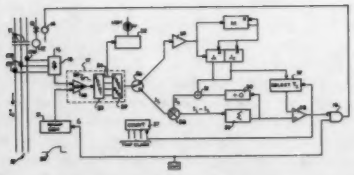
## SIGNAL PROCESSING SYSTEM FOR OVERLOAD RELAY OR THE LIKE

**Frederick A. Stich, Milwaukee, Wis., assignor to Siemens-Allis, Inc., Atlanta, Ga.**

**Filed Apr. 5, 1982, Ser. No. 365,164**

**Int. Cl.³ H02H *3/08***

**U.S. Cl. 361—93** **20 Claims**



1. In a circuit protection device including switch means for opening and closing a multiphase electrical circuit, sensing means for sensing the current flow in the circuit and providing a signal representative thereof comprising

a plurality of current transformer means for producing current-related signals, said current transformer means being connected in a delta configuration;

a plurality of amplifiers each having a first input connected to a different one of the intersections of the current transformer means, and a second input terminal connected to a point of common potential;

a comparator means having first and second inputs;

means connecting the outputs of said amplifier means to one of the inputs of said comparator means; and

ramp generator means for periodically applying a monotonically-charging reference signal to the other of the inputs of said comparator means in order to cause the output of the comparator to adopt a first value when the output of said ramp generator means exceeds the outputs of said amplifiers and a second value when the output of said ramp generator means is less than the output of any of said amplifiers.

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**4,423,459**

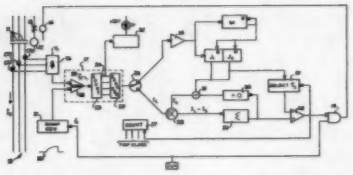
## SOLID STATE CIRCUIT PROTECTION SYSTEM AND METHOD

**Frederick A. Stich, Milwaukee, Wis., and Conrad F. Williams, New Orleans, La., assignors to Siemens-Allis, Inc., Atlanta, Ga.**

**Filed Apr. 5, 1982, Ser. No. 365,554**

**Int. Cl.³ H02H *3/08***

**U.S. Cl. 361—94** **11 Claims**



1. A control for monitoring current flow in a circuit and selectively actuating protective apparatus therefor, comprising:

sensing means for sensing current flow in the circuit and outputting sample signals representative thereof at periodic intervals;

first comparison means for comparing the value of successive sample signals to a value representative of previously-sensed current level;

first and second registers;

means for incrementing said first register in response to a sample signal whose value differs from said previously-sensed current level by less than a predetermined proportion thereof;

means for incrementing said second register in response to a sample signal whose value differs from said previously-sensed current level by more than said predetermined proportion thereof;

second comparison means for comparing the increments accumulated by said registers and outputting a first current threshold signal $I_f$ whose value is at least in part a function of the ratio of the increments accumulated by said first and second registers;

arithmetic means for algebraically adding said current threshold signals to individual sample signals to provide net current signals;

accumulator means for algebraically accumulating said net current signals; and

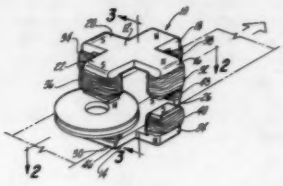
trip signal means for producing a trip signal when the value of the accumulated signals attains a TRIP threshold value.

**4,423,460**

## BULK TAPE ERASER WITH ROTATING MAGNETIC FIELD

**Leon D. Jackson, Troy, and Dan O. Morris, Clawson, both of Mich., assignors to LDJ Electronics, Inc., Troy, Mich.**

**Filed Jan. 4, 1982, Ser. No. 336,633**
**Int. Cl.³ H01F *13/00***
**U.S. Cl. 361—151** **9 Claims**



1. Apparatus for bulk erasing magnetic tapes spirally wound about an axis on a tape carrier, said apparatus comprising:

first and second magnetic structures, each having a set of pole faces, each said set being arranged so that the pole faces of each structure oppose each other and are spaced by an air gap of sufficient width to receive the tape carrier therein; and

circuit means coupled to the first and second structures for electrically producing a rotating magnetic field in the air gap substantially transverse to the tape carrier axis for erasing the tape by maintaining opposing pole faces in each structure with the same magnetic polarities.

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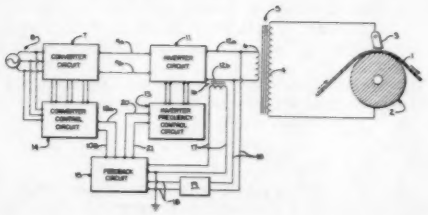
**4,423,461**

## POWER SUPPLY FOR CORONA DISCHARGE TREATMENT SYSTEM

**Stephen H. Kusinos, Menomonee Falls, and Kenneth G. Kafer, West Allis, both of Wis., assignors to Enercon Industries Corporation, Menomonee Falls, Wis.**

**Filed Oct. 1, 1981, Ser. No. 307,620**
**Int. Cl.³ H01T *19/00***
**U.S. Cl. 361—235** **4 Claims**



1. A power supply for a corona treatment system in which the material to be treated is disposed between two metallic electrodes, the combination comprising:

a converter circuit for converting an a.c. input voltage into a d.c. output, the converter being responsive to a voltage feedback signal to control the magnitude of the d.c. output;

an inverter circuit coupled to receive the output of the converter circuit and being operable to generate an a.c. output voltage which is applied across the two metallic electrodes of the corona treatment system, the frequency of which is determined by a frequency feedback signal; and

a feedback circuit coupled to the inverter circuit and connected to receive feedback signals which indicate the voltage and current supplied to the corona treatment system and being operable in response thereto to generate a voltage feedback signal to the converter circuit and a frequency feedback signal to the inverter circuit which alters the operating conditions of the corona treatment process when ionization occurs between the two metallic electrodes to prevent arc-over therebetween.

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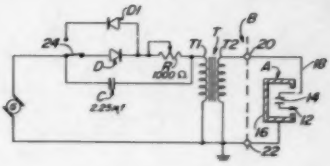
**4,423,462**

## CONTROLLED EMISSION STATIC BAR

**John N. Antonevich, Lansdale, Pa., assignor to The Simco Company, Inc., Hatfield, Pa.**

**Filed Jul. 21, 1982, Ser. No. 400,301**
**Int. Cl.³ H01T *19/00***
**U.S. Cl. 361—235** **11 Claims**



1. A high voltage A.C. power supply for balancing the ion emission of static eliminators coupled to the secondary of a transformer: comprising a biasing circuit connected to the primary of the transformer for directing a D.C. component of current through the core of said transformer sufficient to distort the A.C. wave form, said biasing circuit including impedance means for shortening the duration of the first portion of an A.C. high voltage cycle while increasing the duration of the second portion thereof whereby emission from said static eliminators can be adjusted to provide an equal number of positive and negative ions or a predominance of ions of a particular polarity.

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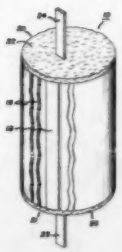
**4,423,463**

## COMBINED CAPACITOR AND RESISTOR

**Charles M. Serradimigni, Hudson Falls, N.Y., assignor to General Electric Company, Hudson Falls, N.Y.**

**Filed Dec. 7, 1981, Ser. No. 328,308**
**Int. Cl.³ H03H *1/00*; H01G *4/18, 1/14***
**U.S. Cl. 361—275** **8 Claims**



1. In an electrical capacitor comprising an array of dielectric strips with metallized electrodes thereon, said strips being arranged in contiguous layer relationship with alternate metal electrodes and dielectric layers, said strips having a predetermined length and arranged in offset relationship so that alternate metallized layers are evenly exposed at each end of the array, and a resistor positioned adjacent a dielectric strip in layer relationship thereto with the ends of said resistor extending at least to about the ends of said array, and a schooped metal layer at each end of said array to simultaneously connect

one end of said resistor and one electrode of said capacitor at each end of said array.

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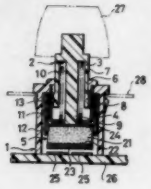
4,423,464

## VARIABLE CAPACITANCE TYPE PUSH-BUTTON SWITCH

Ryutaro Tamura, and Yasushi Endo, both of Iwaki, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1981, Ser. No. 253,588
Claims priority, application Japan, Apr. 16, 1980, 55-49826
Int. Cl.³ H01G 5/01
U.S. Cl. 361—288 13 Claims



1. In a variable capacitance type push-button switch comprising a case made of an insulating material; an insulating substrate held to said case and carrying stationary electrodes; a key stem movable vertically within said case; and a movable member carried by the lower end of said key stem; the improvement wherein said movable member includes a holding member made of an elastic material of high compressibility and having a lower surface substantially convex in section, a movable electrode made of an electrically conductive and flexible material held to said lower surface of said holding member, and a dielectric film carried by said movable electrode and comprised of a synthetic resin of a fluoride type having a relative premittivity of at least eight; and means for depressing said key stem to bring said movable member into engagement with said substrate to deform said lower surface into a more planar configuration and press said dielectric film into pressed contact with said stationary electrodes.

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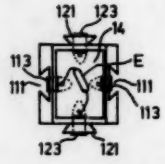
4,423,465

## COMBINATION ELECTRONIC CIRCUIT ELEMENT WITH MULTIDIRECTIONALLY ADJUSTABLE JOINTS

Weng Teng-Ching, 2nd Fl., No. 13, Alley 3, La. 103, Hsiu Feng St., Chung Ho City, Taipei Hsien, and Yang Chi-Ming, 3rd Fl., No. 5, La. 29, Fu Hsing Rd., Hsin Tien City, Taipei Hsien, both of Taiwan

Filed Sep. 30, 1981, Ser. No. 307,310
Int. Cl.³ H05K 7/10
U.S. Cl. 361—394 2 Claims



1. A circuit kit comprising a plurality of interconnectible circuit elements, each element comprising a hollow cube formed of plastic and defining six sides which comprise three pairs of mutually opposite sides, a first of said pairs of sides each having a recess with a narrow opening and a wide bottom and being open-ended, a second of said pairs of sides each having a projection of reverse cone-shape extending outwardly from the center of said second pair of sides such that an outer end of said projection is of larger diameter than an inner end thereof, a third of said pairs of sides each having a removable cover providing access to the interior of said element, a first metal contact plate disposed along said bottom of each of said recesses and including prong means extending into the interior of said element, a second metal contact plate disposed on said outer end of said projection and including prong means extending into the interior of said element, and electrical component means disposed within the interior of said element and electrically connected to said prong means of said first and second metal plates, said projections being sized for slidable endwise insertion into said open-ended recesses of another said element to make electrical contact between said first and second metal plates of said recess and said projection, said reverse cone-shaped projection and said recess being relatively rotatable about the longitudinal axis of said reverse cone-shaped projection to enable said elements to be mutually adjusted while in an interconnected condition.

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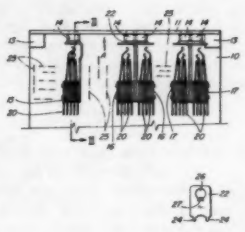
4,423,466

## SUPPORTS FOR TELEPHONE JACKS AND CIRCUIT BOARDS INCORPORATING SUCH SUPPORTS

Roger Beun, Dunrobin, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Mar. 8, 1982, Ser. No. 356,199
Int. Cl.³ H05K 7/02
U.S. Cl. 361—400 11 Claims



1. A support for supporting a front end of an electrical jack on a circuit board, comprising:

a thin , flat, plate-like metal member having at least one aperture thereon, the aperture of a dimension to be a sliding fit on a tubular extension at the front end of a jack;

a deformable tongue extending radially inward into said aperture;

at least two legs extending from a lower edge of the plate-like member, said legs positioned for passage through holes in the circuit board.

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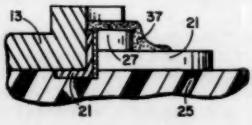
4,423,467

## CONNECTION ARRAY FOR INTERCONNECTING HERMETIC CHIP CARRIERS TO PRINTED CIRCUIT BOARDS USING PLATED-UP PILLARS

Joseph M. Shaheen, La Habra, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 15, 1980, Ser. No. 216,745
Int. Cl.³ H05K 1/18
U.S. Cl. 361—403 2 Claims



1. A connection array for establishing a plurality of electrical connections between circuit pads of a circuit board support and contacts of a hermetically sealed chip carrier housing wherein said contacts comprise semicircular vertical indenta-

tions in the housing horizontal edge periphery, each indentation having a conductive layer therein, comprising, in combination:

a plurality of pillars extending vertically above said circuit board support in an array respectively corresponding to said indentations;

said pillars being carried by different pads of said support, respectively;

said pillars having horizontal dimensions to permit entry partly into said indentations and collectively to position and mechanically locate said chip carrier housing;

solder between said pillars and said conductive layers establishing electrical connections therebetween free of shear stress as a result of different coefficients of expansion of the circuit board and chip carrier housing; and,

said solder being visible in said indentations and externally of said pillars for inspection and cleaning.

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**4,423,468**

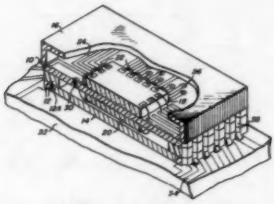
## DUAL ELECTRONIC COMPONENT ASSEMBLY

**Donald F. Gatto, Sunrise, and Juan Milciunas, Ft. Lauderdale, Fla., assignors to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 192,590, Oct. 1, 1980, abandoned. This application May 4, 1982, Ser. No. 374,667**

**Int. Cl.³ H05K** *7/06, 1/14*

**U.S. Cl. 361—404** **2 Claims**



1. An electronic circuit assembly comprising:

an insulating base member having a plurality of through-holes adjacent a central area;

a first plurality of conductive areas on at least one major surface of the base member and each extending from adjacent the perimeter of said central area to an edge of the member;

a second plurality of conductive areas each extending from the perimeter of said central area on one major surface of the base member to and through one of said through-holes to the perimeter of the central area on the other of the major surfaces;

a first semiconductor component affixed to the central area on one major surface of the base member and including conductive portions;

a second semiconductor component affixed to the central area on the other major surface of the base member and including conductive portions;

wire bonds for connecting the conductive portions of the first and second semiconductive components to conductive areas on the respective major surfaces of the base member;

an insulating frame member having a bottom side attached to one major surface of the base member and having essentially the same outer dimensions, having a central aperture dimensioned to expose the first semiconductor component and the associated wire bonds;

a third plurality of conductive areas on the edges of the insulating members and adapted to couple to ones of the first plurality of conductive areas, each of the third plurality of areas extending onto the top side of the frame member;

a first insulating cover means sealingly attached to the second surface of the base member and having a central recess for enclosing the second semiconductor component and the wire bonds attached thereto; and

a second cover means dimensioned to be sealingly attached within a portion of the central aperture of the frame member.

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**4,423,469**

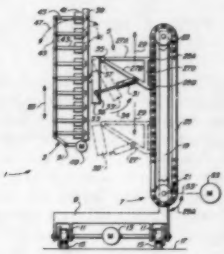
## SOLAR SIMULATOR AND METHOD

**Gene A. Zerlaut; William T. Dokos; William J. Putman, all of Phoenix, and Russell K. Skousen, Chandler, all of Ariz., assignors to DSET Laboratories, Inc., Phoenix, Ariz.**

**Filed Jul. 21, 1981, Ser. No. 285,493**

**Int. Cl.³ F21V** *9/02*

**U.S. Cl. 362—2** **13 Claims**



1. A solar simulator for producing a radiation spectrum that is similar to the solar spectrum, said solar simulator comprising in combination:

(a) a plurality of spaced solar lamps that each produce a spectrum similar to the solar spectrum, each of said solar lamps having a direction axis along which light emitted by that solar lamp travels;

(b) an array frame for supporting said plurality of solar lamps, said solar lamps being arranged to form a lamp array;

(c) a plurality of lamp support means pivotally connected to said array frame for supporting said plurality of lamps in a plurality of predetermined orientations relative to a plane of said array frame;

(d) lamp orientation maintaining means connected to said lamp support means for controllably, continually maintaining the orientations of said lamps so that the direction axes of said respective lamps are parallel to each other;

(e) array frame support means pivotally connected to said array frame for supporting said array frame in a predetermined orientation so that the plane of said array frame is parallel to a light-receiving surface of an object to be tested;

(f) vertical positioning means for raising said lamp array to a predetermined elevation relative to said object; and

(g) horizontal positioning means for horizontally moving said lamp array to a predetermined lateral position relative to said object,

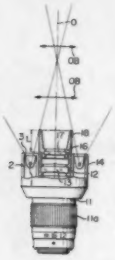
said predetermined elevation, said predetermined lateral position, and said plurality of predetermined orientations having values that cause the intensity of light received from said lamps on the surface of said object to be uniform, to have a predetermined intensity, and to have a predetermined angle of incidence to the surface of said object.

4,423,470

## LENS BARREL SUITABLE FOR FLASH PHOTOGRAPHY

Hideshi Naito, Tokyo; Hideyo Nozawa, Ohmiya, and Kazuyuki Kazami, Tokyo, all of Japan, assignors to Nippon Kogaku K. K., Japan

Filed Aug. 26, 1981, Ser. No. 296,323
Claims priority, application Japan, Aug. 29, 1980, 55/121798[U]
Int. Cl.³ G03B 15/02
U.S. Cl. 362—17 5 Claims



1. In an apparatus including, in combination, a lens barrel having photographic lens means and a stop, and flashlight-emitting means which is mounted at an outer peripheral portion of said lens barrel and produces flashlight for illuminating a subject to be photographed, the improvement for very proximate photography in which the subject is positioned at a short film-to-subject distance and is illuminated by said flashlight to effect phototaking via said lens barrel, comprising:

light-intercepting means for intercepting a part of the flashlight emitted from said flashlight-emitting means and directed to the optical axis of said lens means, the light-intercepting means being positioned so as to enlarge an area that provides little illumination by said flashlight of said subject to be photographed, the area being defined by both said lens barrel and the illumination pattern of said flashlight; said light-intercepting means being interposed in the path of the flashlight so that it is effective during said very proximate photography.

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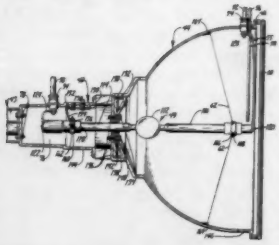
4,423,471

## MOBILE LIGHTING FIXTURE, METHOD AND BOOM

Myron K. Gordin; James L. Drost, both of Oskaloosa, and Bryan L. Mydosh, Given, all of Iowa, assignors to Mycro-Group Company, Oskaloosa, Iowa

Filed Sep. 15, 1982, Ser. No. 418,452
Int. Cl.³ F21V 33/00
U.S. Cl. 362—96 16 Claims



1. A lighting fixture, comprising:

(a) a hemispherical hollow reflector having a rear apex end and a front end;

(b) a socket having one open end for reception of a lamp, said socket being connected to said apex end of said reflector;

(c) a high wattage metal halide arc lamp, having front and rear ends, with said rear end being received in said open end of said socket;

(d) a vertically and horizontally adjustable mounting elbow attached to one end of said socket, and also attached to a fixture holder,

(e) said lamp being positioned longitudinally along the axis of said socket for maximum beam reflection efficiency;

(f) shock dampening mounting means to mount said lamp in said socket and

(g) a pressurized air system associated with said fixture for cooling the first and second ends of said lamp during operation.

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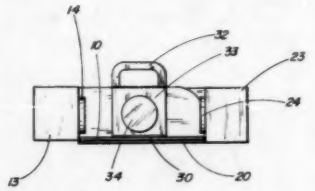
4,423,472

## PORTABLE BARGE LIGHTS

Raymond H. Duthu, P.O. Box 1007, Marrero, La. 70072

Filed Jun. 14, 1982, Ser. No. 388,496
Int. Cl.³ F21V 21/00
U.S. Cl. 362—184 10 Claims



1. A three unit portable navigation light system for a marine vessel, comprising:

a totally self-contained port sidelight having a portable power source, an associated lamp, and an enclosure having a bottom edge and two side edges housing said power source and said associated lamp, at least one activating means associated with said lamp for switching said lamp, a red lens mounted on said enclosure over said lamp, a base extending horizontally out from the bottom edge of the side of said enclosure and away from the surface of said enclosure on which is mounted said lens, a screen extending from a side edge of said enclosure perpendicular to said base and fixedly attached to the edge of said base and extending out away from the surface of said enclosure on which is mounted said lens, a carrying handle attached to said screen and a securing means attached to said base for removably securing the base to the marine vessel;

a totally self-contained starboard sidelight, said port and said starboard sidelights being removeably nestable together one upon the base of the other, said starboard sidelight having a portable power source, an associated lamp, and an enclosure having a bottom edge and two side edges housing said power source and said associated lamp, at least one activating means associated with said lamp for switching said lamp, a green lens mounted on said enclosure over said lamp, a base extending horizontally out from the bottom edge of the side of said enclosure on which is mounted said lens, a screen extending from a side edge of said enclosure perpendicular to said base and fixedly attached to the edge of said base and extending out away from the surface of said enclosure on which is mounted said lens, a carrying handle attached to said screen and coinciding in position to the handle on said port sidelight when said sidelights are nested together, and securing means attached to said base for removably securing the base to the marine vessel; and

a totally self-contained yellow light removably nestable upon the base of one of said sidelights, said yellow light

having a portable power source, an associated lamp, and an enclosure having a bottom edge and two side edges housing said power source and said associated lamp, at least one activating means for switching said lamp, a yellow lens mounted on said enclosure over said lamp, a base extending horizontally out from the bottom edge of the side of said enclosure and extending out away from the surface on which is mounted said lens, two, opposed screens extending from the side edges of said enclosure perpendicular to said base and fixedly attached to the side edges of said base and extending out away from the surface of said enclosure on which is mounted said lens, a carrying handle attached to said enclosure and coinciding in position to the handles on said port and starboard sidelights when the three lights are nested together, and securing means attached to said base for removably securing the base to the marine vessel.

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**4,423,473**

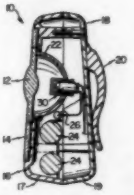
## SAFETY LIGHT OR THE LIKE

**J. Darrell Kirkley, Dallas, Tex., assignor to Jog-O-Lite, Inc., Dallas, Tex.**

**Filed Sep. 29, 1982, Ser. No. 428,112**

**Int. Cl.³ F21L *7/00***

**U.S. Cl. 362—186** **13 Claims**



**1.** A safety light for athletes or the like to be recognized by oncoming vehicles comprising:

(a) housing including a first lens member disposed therein and adapted to contain battery means;

(b) light generating means contained within said housing for generating intermittent bursts of light;

(c) first reflector means located within said housing and positioned for directing light generated by said light generating means through said first lens member; and,

(d) second reflector means mounted on the outer surface of said housing for reflecting light from oncoming vehicles.

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**4,423,474**

## MINE LAMP

**Martin Hamacher, Westerholter Str. 791, 4352 Herten, Fed. Rep. of Germany**

**Filed Feb. 26, 1981, Ser. No. 238,421**

**Claims priority, application Fed. Rep. of Germany, Mar. 1, 1980, 3007972**

**Int. Cl.³ F21S *3/00*; F21V *15/00, 17/00***

**U.S. Cl. 362—223** **12 Claims**

**1.** A lamp comprising:

a support;

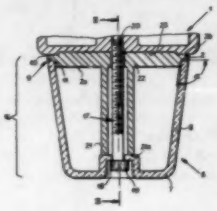
a flat base plate having an outer edge and a forwardly directed face, said outer edge being formed with an annular abutment surface lying in a plane generally parallel to and offset backwardly from said face and an annular outwardly directed guide surface inclined at an obtuse angle to said abutment surface;

a light tube;

means for releasably supporting said tube on said base plate within said edge and in front of said face;

a concave, at least partially transparent, and at least limitedly elastically deformable cover having an end wall generally parallel to and offset forwardly of said face and a continuous annular side wall extending backwardly from and at said obtuse angle to said end wall and having an annular rear edge formed with an annular and generally planar surface engaging backwardly against said abutment surface and an annular retaining surface engaging inwardly against said guide surface;

means including interengaging formations on said retaining



and guide surfaces for elastically retaining said cover in place on said base plate with said rear edge in annular all-around contact with said outer edge; and

means for releasably securing said plate to said support with said face directed forwardly away from said support and including at least one screw having a head bearing against said cover at said end wall thereof and a shank passing through said base plate and threaded into said support.

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**4,423,475**

## MULTI-CHAMBER LAMP FOR VEHICLES

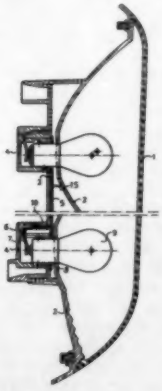
**Richard Bärtl, Lippstadt, Fed. Rep. of Germany, assignor to Westfälische Metall Industrie KG Hueck & Co., Lippstadt, Fed. Rep. of Germany**

**Filed Feb. 12, 1982, Ser. No. 348,394**

**Claims priority, application European Pat. Off., Mar. 19, 1981, 81102053.6**

**Int. Cl.³ F21V *21/00***

**U.S. Cl. 362—249** **2 Claims**



**1.** Multi-compartment lamp for vehicles comprising; a one-piece sheet-metal lamp holder; sockets having openings for bulbs and having bodies surrounding a base and molded in one-piece with the holder or reflector body or with a rear-beam mask; at least one nominal expansion site comprising a punched-out U-shaped path between the sockets, said sockets being widely separated; said U-shaped path having two parallel legs oriented along the direction of the desired lamp-holder expansion; said legs having a connecting area therebetween

which is bent out of the plane of the lamp holder at an angle of substantially 90°, said expansion site being formed by a path being bent around an edge dependent on the strength of the sheet metal so that widening of the path increasing negligibly bending moment arising in adjustment of distance between openings for bulbs in the lamp holder, said expansion site having a substantially large cross-section relative to substantially low bending moment.

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4,423,476

## D.C. BLOCKING OSCILLATOR CHARGING DEVICE FOR ELECTRIC VEHICLES

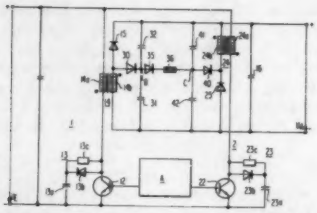
Erhard Neumann, Rudersberg-Schlechtbach, Fed. Rep. of Germany, assignor to Deutsche Automobilgesellschaft mbH, Fed. Rep. of Germany

Filed Mar. 12, 1981, Ser. No. 243,197

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 3009359

Int. Cl.³ H02M *3/335*

U.S. Cl. 363—20 12 Claims



1. A charging device, particularly a vehicle-bound charging device for charging the traction batteries of an electric vehicle from the a.c. current mains comprising:

a converter module;

comprising at least two d.c. blocking converters. each converter including a controlled power transistor, a cutoff relief circuit, and a power transformer, wherein the secondary winding is connected in series with a rectifier diode, and a smoothing capacitor is connected in parallel to this series circuit,

the power transistors of each converter are activated by a control circuit in the push-pull mode with a phase shift of 180°, and

the parallel-connected secondary sides of the two blocking converters are connected in such a way that the one secondary winding, on the one hand, is connected to the negative output terminal and, on the other hand, via the one rectifier diode to the positive output terminal;

the other secondary winding is connected, on the one hand, to the positive output terminal and. on the other hand, via the other rectifier diode to the negative output terminal;

a first diode is connected as the relief circuit on the secondary side from the junction point of the one secondary winding with the one rectifier diode to a first point, from the latter a second diode is connected in series with a choke to a second point, and from the latter a third diode is connected to the junction point of the other secondary winding with the other rectifier diode,

wherein all diodes on the secondary side are poled in such a way that. they are current-conductive away from one secondary winding and/or toward the other secondary winding, and

wherein respectively one capacitor is connected between said first point and the positive output terminal and between said second point and the negative output terminal; and that a smoothing capacitor common to all is provided between the output terminals.

4,423,477

## RECTIFIER CONTROLLER

George P. Gurr, Dunwoody, Ga., assignor to Sangamo Weston, Inc., Norcross, Ga.

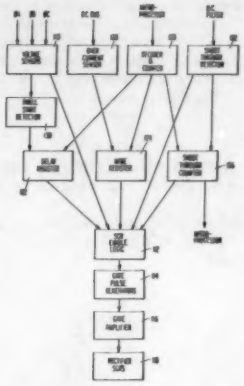
Continuation of Ser. No. 54,025, Jul. 2, 1979, Pat. No. 4,346,432.

This application Jan. 4, 1982, Ser. No. 336,833

The portion of the term of this patent subsequent to Aug. 24, 1997, has been disclaimed.

Int. Cl.³ H02H *7/127;* H02P *13/24*

U.S. Cl. 363—54 17 Claims



1. A controller for a rectifier of first, second and third phase alternating current voltage signals for supplying a controlled direct current voltage to a load, said rectifier including three pairs of solid state gate controlled rectifying devices connected in a bridge configuration to a common output bus, each of said pair of devices connected to receive one of said first, second or third phase voltage signals to rectify both the positive half and negative half of the respective applied voltage signal, which comprises:

means for detecting comprising voltage detection means for receiving said first, second and third voltage signals and for providing outputs when respective ones of said voltage signals are greater than ones of the other said voltage signals; and

means for providing gate control signals comprising logic means responsive to comparator means responsive to said voltage signals for generating a dwell output signal each time any pair of said voltage signals is equal, and responsive to said outputs for providing a first set of gate control signals for indicating which of said voltage signals are most positive at any point in time and for providing a second set of gate control signals for indicating which of said voltage signals are most negative at any point in time, said first set of gate control signals connected to be applied to the gates of one of said devices in each pair, and said second set of gate control signals connected to be applied to the gates of the other of said devices in each pair.

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4,423,478

## PHASE CONTROLLED REGULATED POWER SUPPLY

Randolph A. Bullock, Rochester, and Lawrence J. Mason, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 20, 1981, Ser. No. 285,236

Int. Cl.³ G05F *1/64*

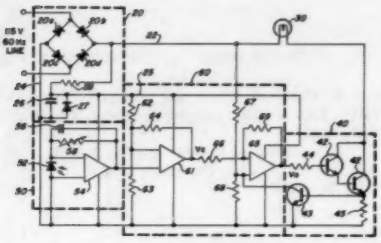
U.S. Cl. 363—89 4 Claims

1. A phase-controlled power supply circuit for providing regulated dc power to a radiant energy-producing load, said power supply circuit adapted to compensate for the effects of

rapid power fluctuations in the ac input line source, said circuit comprising:

rectifier means for converting ac input voltage to full wave rectified dc voltage,

means for generating a first output signal $V_c$ representative of the radiant energy emanating from said load, said generating means including a photosensing device which generates a current proportional to the radiant energy from the load impinging thereon, a first amplifier for converting said current into a voltage output $V_2$ and a second amplifier for amplifying output $V_2$ to generate output signal $V_c$,



means for comparing output $V_c$ with a portion of the rectified dc voltage to produce a second output $V_o$, said comparing means comprising a third amplifier means for comparing the signal $V_c$ received at the negative input of said third amplifier with a portion of the rectified dc voltage received at the positive input of said third amplifier, and

a transistor switching circuit coupled between said comparing means and said load, said switching circuit being adapted to be turned on and off at a rate determined by the rate of change of the level of signal $V_o$,

whereby the load is turned on and off at a rate consistent with the switching circuit.

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**4,423,479**

## CACHE/DISK SUBSYSTEM WITH ACQUIRE WRITE COMMAND

**Merlin L. Hanson, Arden Hills; Robert E. Swenson, Mendota Heights, and Anthony R. Talarczyk, Montgomery, all of Minn., assignors to Sperry Corporation, New York, N.Y.**

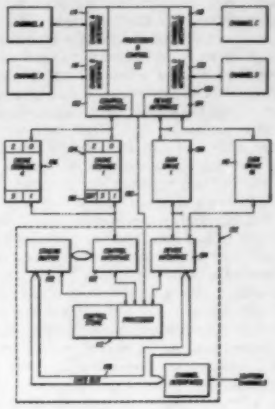
**Filed Nov. 14, 1980, Ser. No. 207,154**

**Int. Cl.³ G06F *13/02***

**U.S. Cl. 364—200** **5 Claims**

1. In a cache/disk subsystem including a host processor, a disk drive device for driving a disk, a cache store for storing segments of data which are copies of segments of data which have been read from, or are to be written to disk space on said disk, and a storage control unit for controlling the transfer of data between said host processor, said disk and said cache store in response to commands specifying a function and disk data addressing information specifying the disk space at which said function is to be performed, said storage control unit being responsive to a normal write command from said host processor for staging data from the specified disk space to said cache store and overlaying it with data from said host processor if less than all of the data from the specified disk space is resident in said cache store, the improvement comprising:

control means in said storage control unit, responsive to an acquire write command from said host processor indicating that the addressing information in the acquire write command specifies disk space not previously written to, for inhibiting the staging of data from said specified disk space to said cache store, and;



further means responsive to said acquire write command for transferring data from said host processor through said storage control unit to said cache store.

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**4,423,480**

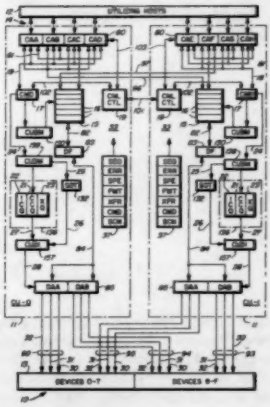
## BUFFERED PERIPHERAL SYSTEM WITH PRIORITY QUEUE AND PREPARATION FOR SIGNAL TRANSFER IN OVERLAPPED OPERATIONS

**Wayne J. Bauer, Longmont; William C. Dodt, Broomfield, both of Colo.; Charles R. Kirkpatrick, Tucson, Ariz.; Ted A. Rehage, Longmont, Colo.; Francis L. Robinson, Tucson, Ariz., and William K. Taylor, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Mar. 6, 1981, Ser. No. 241,323**

**Int. Cl.³ G06F *3/00***

**U.S. Cl. 364—200** **14 Claims**



1. Interconnection means for connecting a control unit to a plurality of controlled devices, including the combination of:

first bidirectional-connection means for coupling said control unit to said controlled devices including a data path means for transferring data signals and timing path means

for timing such transfer of data signals over said data path means;

second bidirectional-connection means for coupling said control unit to said controlled devices including separate circuit means in each said controlled device and said control unit for bidirectionally transferring multiple tag signals between said control unit and said controlled devices for selecting a one of said controlled devices to transfer data signals over said data path means; respective ones of said tag signals signifying status signals, first connection command signals and data signals being transferred over said data path means, and being coupled to said first bidirectional-connection means data path means via each of said separate circuit means in each said controlled device and said control unit;

third bidirectional-connection means for coupling said control unit to said controlled devices and being independent of said first and second bidirectional-connection means, command conducting means in said third bidirectional-connection means for carrying command signals having address signals from said control unit to a one of said controlled devices indicated by said address signals; and

third-connection circuit means in each of said controlled devices electrically connected to said command conducting means and being respectively responsive to a one of said address signals signifying a respective one of said controlled devices to decode said third bidirectional-connection command signals, further means in each of said controlled devices electrically connected to said third-connection circuit means for being responsive to first and second ones of said decoded third bidirectional-connection command signals to respectively actuate such respective controlled device to respectively prepare for receipt of predetermined first and second connection command signals or to deactivate said controlled device whereby signal transfers over said first and second connection means are prepared for response by said controlled device to respective ones of said third bidirectional-connection means carried command signals.

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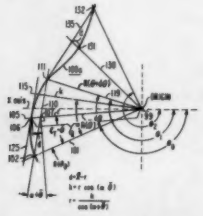
**4,423,481**

## NUMERICALLY CONTROLLED METHOD OF MACHINING CAMS AND OTHER PARTS

**Keith S. Reid-Green, and William Z. Marder, both of Pennington, N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed May 26, 1981, Ser. No. 266,985**
**Int. Cl.³ G06F *15/46;* G05B *19/41***
**U.S. Cl. 364—474** **6 Claims**



1. In a system having prime moving means for controlling the relative position of a working surface and a cutting edge so that said cutting edge approximates a path with respect to said working surface definable by a mathematical expression, a method of moving said cutting edge relative to said working surface in a series of successive straight line segments each of which lies between a pair of first and second points on said definable path with the second point of each pair being the first point of the next pair and comprising the steps of:

determining the corrdinates for said first and second points for each successive straight line segment with each successive straight line segment having the same maximum distance $d \pm \Delta d$ from said definable path measured along a line extending from a common reference and between said pair of first and second points, and intersecting said definable path at a given point with the tangent to said definable path at said given point defining a line to which the said each successive line segment is parallel, and where $\Delta d$ is a predetermined tolerance;

generating prime moving means control signals in response to and in accordance with said determined coordinates;

energizing said prime moving means in accordance with said control signals to move said cutting edge with respect to said working surface successively along the said straight line segments.

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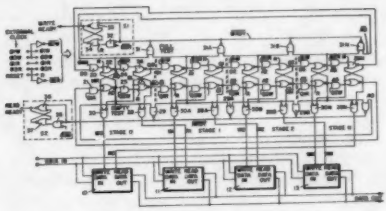
**4,423,482**

## FIFO REGISTER WITH INDEPENDENT CLOCKING MEANS

**Arthur K. Hargrove, Irvine, and Ronald L. Brown, Fountain Valley, both of Calif., assignors to Sperry Corporation, New York, N.Y.**

**Filed Jun. 1, 1981, Ser. No. 268,791**
**Int. Cl.³ G06F *5/06***
**U.S. Cl. 364—200** **18 Claims**



1. A register circuit for interfacing between two data processors which may have different operating speeds, comprising,

a plurality of independently clocked stages which can store binary signals therein,

clock means connected to each of said stages in order to activate said stages at prescribed times,

initializing means for supplying a pulse to each of said stages for simultaneously setting all of said stages to prescribed conditions with at least one of said stages set to a different condition than all of the other stages,

testing means for continuously determining the conditions in said stages and supplying control signals to said data processors to control the operation thereof relative to said register circuit,

synchronizer means connected to said testing means for selectively permitting said stages to be operated only at specified times,

register means controlled by said stages to selectively pass data between said data processors through said register means, and

data bus means connected to said register means to receive or supply data in accordance with the conditions of said register means.

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**4,423,483**

## DATA PROCESSOR USING A READ ONLY MEMORY FOR SELECTING A PART OF A REGISTER INTO WHICH DATA IS WRITTEN

**Steven A. Tague, Billerica, and Virendra S. Negi, Pepperell, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.**

**Filed Dec. 24, 1980, Ser. No. 220,219**
**Int. Cl.³ G06F *7/50***
**U.S. Cl. 364—200** **8 Claims**

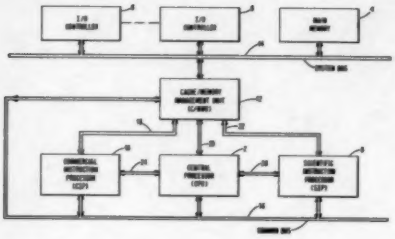
1. A data processing system including a commercial instruc-

tion processor for executing decimal arithmetic instructions, a main memory for storing operands and said decimal numeric instructions including descriptors for describing the characteristics of said operands, said commercial instruction processor including apparatus, responsive to said decimal arithmetic instructions including said descriptors for writing decimal information of sid operands in selected positions of a register comprising:

first means responsive to said decimal arithmetic instructions for generating a plurality of control signals;

second means responsive to said descriptors for generating a type signal in a first state indicative of a packed decimal operand and said type signal in a second state indicative of a string decimal operand, and generating position signals indicative of one of said selected digit positions of said register;

third means coupled to said first and said second means and responsive to said plurality of control signals and said type signal for generating a plurality of write control signals; and



fourth means coupled to said second and said third means and responsive to said position signals and said plurality of write control signals for generating a plurality of write signals,

wherein said register is coupled to said fourth means and responsive to said plurality of write signals for selecting said digit positions for writing a byte of said decimal information of said string decimal operand and for writing a decimal digit of said decimal information of said packed decimal operand, and

wherein said third means includes:

logic means responsive to said plurality of control signals for generating an enable signal; and

a multiplexer responsive to said plurality of control signals and said enable signal in a second state for selecting said type signal in said first state for generating a first of said plurality of write control signals in a second state and a second of said plurality of write control signals in a first state,

and selecting said type signal in said second state for generating said first write signal in a first state and said second write signal in a second state.

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**4,423,484**

## IRRIGATION CONTROL SYSTEM

**William H. Hamilton, 131 SW. 156th St., Seattle, Wash. 98166**

**Filed Mar. 30, 1981, Ser. No. 248,704**

**Int. Cl.³ G06F *15/46*; G05D *7/06***

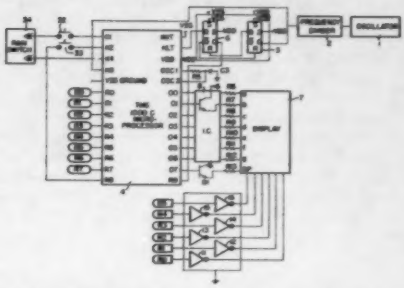
**U.S. Cl. 364—420** **11 Claims**

1. An irrigation control system comprising:

clock means for producing a clock output signal at predetermined time intervals;

resettable switch means connected to said clock means for producing an actuating signal in response to said clock output signal;

computing means for processing an input signal and producing an output signal for controlling an irrigation cycle, said computing means having a halt input connected to said switch means for receiving said actuating signal therefrom to actuate said computing means from a powered quiescent condition to perform a predetermined logic sequence, said switch means including a first type D flip-flop having a clock terminal connected to said clock means to receive said clock output signal therefrom and a second D flip-flop having a reset terminal connected to a Q output of said first flip-flop, the Q output of said second



flip-flop being connected to said halt input, whereby said clock output signal results in application of an actuating signal to said input for actuating said computing means; and

valve means connected to said computing means and controlled thereby for regulating fluid flow for said irrigation cycle.

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**4,423,485**

## ELECTRIC CONTROL APPARATUS FOR FUEL INJECTION PUMPS

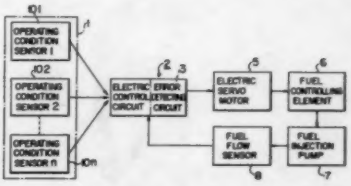
**Hiroshi Sami, Numazu; Osamu Ito, Toyota; Shizuo Kawai, Kariya; Nobuhito Hobo, Inuyama; Teruo Nishio, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan**

**Filed Apr. 1, 1981, Ser. No. 249,866**

**Claims priority, application Japan, Apr. 4, 1980, 55-44967**

**Int. Cl.³ F02M *39/00*; F02D *5/02***

**U.S. Cl. 364—431.05** **6 Claims**




1. An electric control apparatus for fuel injection pumps of an internal combustion engine comprising:

a fuel injection pump;

fuel flow sensor means for generating a fuel flow signal indicative of a net quantity of fuel flow supplied to said fuel injection pump;

operating condition sensor means for detecting operating condition parameters of said engine and generating detection signals;

servo means for actuating a fuel injection quantity controlling element of said fuel injection pump which controls the quantity of fuel injected by said fuel injection pump;

electric control circuit means including means for computing an actual fuel injection quantity and generating an

actual fuel injection quantity indicative signal, means for computing a desired fuel injection quantity in accordance with the fuel flow signal from said fuel flow sensor means and the detection signals from said operating condition sensor means and generating a desired fuel injection quantity indicative signal, means for receiving the actual fuel injection quantity indicative signal and said desired fuel injection quantity indicative signal, detecting a difference between both signals and generating an error signal corresponding to the difference, and a drive circuit responsive to the error signal to energize said servo means and thereby to actuate said fuel injection quantity controlling element of said fuel injection pump, thereby controlling the actual fuel injection quantity at said desired fuel injection quantity; and

feedback means for generating a feedback signal in proportion to a differentiation of an actuation output of said servo means and algebraically adding the feedback signal to the desired fuel injection quantity indicative signal received by said error signal generating means.

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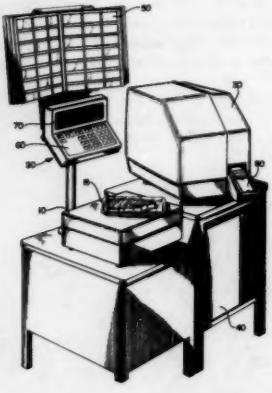
**4,423,486**

## COMMODITY DISPLAY FOR WEIGHING SCALE

George J. Berner, Xenia, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Apr. 30, 1981, Ser. No. 258,965
Int. Cl.³ G06K *15/02*
U.S. Cl. 364—466 9 Claims



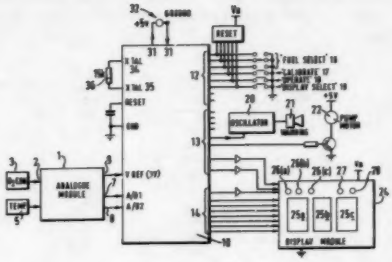
1. A combined weighing scale and label printer for weighing a packaged commodity, printing an adhesive label with information regarding the weight, unit price and total value of the commodity and delivering the printed label printed side down for application to the package including a keyboard for entering a code corresponding to the name of the packaged commodity; visual display means responsive to a keyboard entry for displaying a human-readable verification of the commodity name prior to printing a first label for said commodity; and means for computing the total value of the packaged and weighed commodity, and in response thereto, printing such total value along with the weight, unit price and commodity name on a label for application to said package.

**4,423,487**

## APPARATUS FOR MEASURING THE EFFICIENCY OF COMBUSTION APPLIANCES

Howard A. Buckenham, Brentwood; Hugh V. Feldman; Paul Gotley, both of Harlow, and Richard Young, High Wycombe, all of England, assignors to Neotronics Limited, Takeley, England

Filed Nov. 20, 1980, Ser. No. 208,693
Claims priority, application United Kingdom, Nov. 23, 1979, 7940671; Oct. 22, 1980, 8034110
Int. Cl.³ G06F *15/20*; G01D *21/02*; F23N *5/24*
U.S. Cl. 364—551 23 Claims

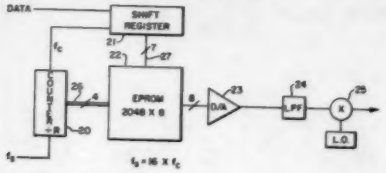


7. Apparatus for measuring the degree of efficiency of a combustion appliance comprising a first sensor for producing an output signal which varies with the concentration of a constituent gas of the exhaust gases of the appliance, a second sensor for producing an output signal which varies with the temperature of the exhaust gases, and computation means adapted to receive the sensor output signals and operable on instruction for deriving therefrom measurement values representing the concentration of said constituent gas and the temperature of the exhaust gases and for applying these measurement values in the computation of a predetermined formula relating the degree of combustion efficiency to the temperature of the exhaust gases, and the concentration of said constituent gas for providing an output signal indicative of the combustion efficiency of the appliance; the computation means is also operable to calibrate at least one of the sensor output signal from a test measurement made with that sensor, and wherein the computation means is operable in response to a calibrate instruction for deriving from the output signal produced by at least one of the sensors during a test measurement of a known value, calibration information regarding that sensor, and for automatically calibrating the sensor output signal applying said calibration information to introduce a calibration correction when deriving measurement values from the sensor output signal produced during a subsequent measurement or measurements taken with the sensor; the computation means in carrying out a said test measurement of the said constituent gas concentration of ambient air or other test gas, automatically sampling the value of the output signal of the first sensor, comparing its value with that of a stored value representing the estimated value of the sensor output signal for the nominal or known concentration of said constituent gas in the test gas, and if the difference between the compared values is above a predetermined limit, repeating the comparison after a predetermined interval, until the difference between the compared values falls within the limit.

## 4,423,488
## DIGITAL FILTER EMPLOYING PROM FOR STORING POSITIVE AND NEGATIVE IMPULSE RESPONSE VALUES

David K. Campbell, Melbourne Beach, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jan. 9, 1981, Ser. No. 223,572
Int. Cl.³ G06F 15/31
U.S. Cl. 364—724 7 Claims

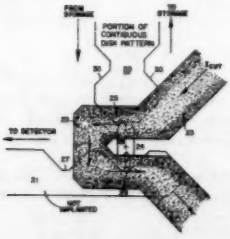



1. A digital filter comprising:
first means for receiving and storing sequential values of an input binary data signal;
second means coupled to said first means for producing a first clock signal in response to which said first means stores sequential values of said input binary data signal;
third means for storing a plurality of filter output signal values each of which is representative of the sum of the values of individual positive and negative impulse response characteristics of a prescribed filter function for the sequential values of said input binary data signal stored by said first means, at each of a plurality of sampling points, over the signal value span stored thereby; and
fourth means, coupled between said third means and said first and second means, for addressing said third means in accordance with the contents of said first and second means and thereby causing said third means to produce filter output signal values stored therein.

## 4,423,489
## REPLICATOR FOR ION-IMPLANTED BUBBLE DOMAIN DEVICES USING STRETCHING ACTION OF CHARGED WALL

Bruce E. MacNeal, Fullerton, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 14, 1981, Ser. No. 263,659
Int. Cl.³ G11C 19/08
U.S. Cl. 365—12 8 Claims

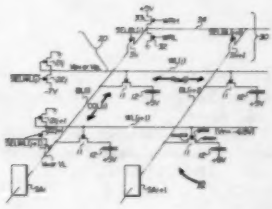



1. A magnetic bubble domain device comprising:
a planar layer of magnetic material in which magnetic bubble domains can be propagated;
a first bubble domain guide structure coupled to said layer and defining a first bubble domain propagation path for guiding the movement of said bubble domains in said layer in response to a cyclical change in the orientation of a re-orienting magnetic field within the plane of said layer;
a second bubble domain guide structure coupled to said layer, and defining a second propagation path for guiding the movement of said bubble domains in said layer in response to the cyclical change in orientation of said reorienting magnetic field in the plane of said layer;
a replicate bubble domain guide structure coupled to said layer and functioning to replicate a bubble domain travelling along said first bubble propagation path onto said second bubble propagation path in response to an activating signal, characterized in that said replicate guide structure includes two spaced apart attractive positions for stretching a bubble domain in response to the charged wall movement, and conductor means disposed between said positions functioning to sever said stretched bubble domain in response to said activating signal.

## 4,423,490
## JFET DYNAMIC MEMORY

Bruce B. Roesner, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 27, 1980, Ser. No. 200,997
Int. Cl.³ G11C 11/40
U.S. Cl. 365—149 11 Claims

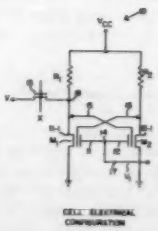


11. A non-punchthrough type of dynamic random access memory having junction field effect transistors as the transfer gates for the memory cells; each of said transistors having a negative threshold $V_T$; and means for generating voltages $V_{GH}$ and $V_{GL}$ directly on the gate of one of said junction field effect transistors to respectively select and deselect a memory cell, and for generating voltages $V_H$ and $V_L$ on the source of said one transistor representing information to store those voltages in a selected cell wherein $V_{GH}-V_T>V_H$, $V_{GL}-V_T<V_L$ and $V_L>V_{GH}$ so that current flows between said source and drain but not through said transistor's gate.

## 4,423,491
## SELF-REFRESHING MEMORY CELL

Andrew C. Tickle, Los Altos, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Nov. 23, 1981, Ser. No. 324,343
Int. Cl.³ G11C 11/40
U.S. Cl. 365—154 4 Claims




1. A memory cell comprising:

a first MOS transistor and a second MOS transistor, each MOS transistor possessing a source, a drain and a control gate, the control gates of said two MOS transistors being connected to a source of gate potential;

a pair of resistive elements, one lead of each resistive element being connected to a corresponding drain of one of said MOS transistors, the other lead of each resistive element being connected to a voltage source;

a first floating gate positioned between the gate and the channel of said first MOS transistor but insulated therefrom and having a portion extending above but separated by dielectric from the drain of said second transistor, said dielectric having a portion thereof sufficiently thin to allow electrons to tunnel therethrough between the drain of said second transistor and said first floating gate; and

a second floating gate positioned between the gate and the channel of said second MOS transistor but insulated therefrom and having a portion extending above but separated by dielectric from the drain of said first transistor, said dielectric having a portion thereof sufficiently thin to allow electrons to tunnel therethrough between the drain of said first transistor and said second floating gate.

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**4,423,492**

## SEMICONDUCTOR MEMORY DEVICE

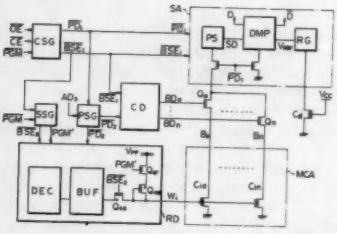
**Masanobu Yoshida, Kawaguchi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Dec. 11, 1981, Ser. No. 329,939**

**Claims priority, application Japan, Dec. 18, 1980, 55-179253**

**Int. Cl.³ G11C *7/00***

**U.S. Cl. 365—226** **10 Claims**




1. A semiconductor memory device, comprising:

a plurality of word lines;

a plurality of bit lines;

a plurality of memory cell transistors each of which is disposed at one of the intersections of said word lines and said bit lines and each of which comprises a control gate operatively connected to one of said word lines and a floating gate which stores electrons;

a first power supply terminal which receives a normal operating voltage;

a second power supply terminal which receives a programming voltage used for programming the memory device; and

a gate selection circuit, operatively connected to said first and second power supply terminals and said word lines, which connects said second power supply terminal to one or more selected word lines when the threshold potential of said memory cell transistors is measured, said first power supply terminal being connected to said normal operating voltage having a constant potential, and the potential of said second power supply terminal being changed, thereby measuring said threshold potential.

**4,423,493**

## ELASTIC MEMORY WITH ARRANGEMENT FOR REDUCING PHASE FLUCTUATIONS IN THE OUTPUT CLOCK PULSE

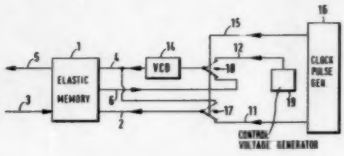
**Karl H. Annecke, Backnang, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs GmbH, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Jun. 22, 1982, Ser. No. 390,892**

**Claims priority, application Fed. Rep. of Germany, Jun. 23, 1981, 3124516**

**Int. Cl.³ G11C *7/00, 8/00***

**U.S. Cl. 365—233** **3 Claims**




1. In combination with an elastic memory including a first input for the writing in of data, a first output for the reading out of data, a writing clock pulse input, a reading clock pulse input, and a further output for a control signal corresponding to the distance between the memory cell into which data are written in via said first input and the memory cell from which data are read out via said first output, a voltage controlled pulse generator means having its control input connected to said further output and its output connected to said reading clock pulse input, said generator means being responsive to said control voltage at said further output for generating said reading clock pulses, and a source of external clock pulses for normally supplying input clock pulses to said writing clock pulse input and supplying a signal which indicates a malfunction or absence of the said external clock pulses; an arrangement for reducing phase fluctuations in the reading clock pulses upon the malfunction or absence and re-appearance of said external input clock pulse comprising: means for causing a clock pulse generated at a desired frequency fo to be applied to said writing and said reading clock pulse inputs during the time of absence or malfunction of said external input clock pulses, so that a desired minimum distance between said memory cell into which data are written in and said memory cell from which data are read out is maintained during the time of absence or malfunction of said external input clock pulse.

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**4,423,494**

## BEAM STEERABLE SONAR ARRAY

**Kenneth W. Groves, Forest Hills, and John D. Lea, Huntington, both of N.Y., assignors to Sperry Corporation, New York, N.Y.**

**Filed Sep. 21, 1981, Ser. No. 303,693**

**Int. Cl.³ G01S *3/80*; G10K *11/34***

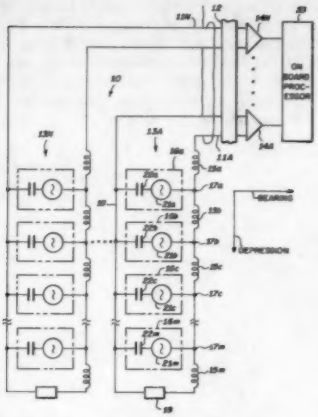
**U.S. Cl. 367—123** **9 Claims**

1. An acoustic array system comprising:

means having first and second terminal means for providing sections of serially coupled electrical inductances each with an inductance value substantially equal to L;

transducer means for exchanging acoustic and electrical energy having sections with associated capacitance value substantially equal to C, said sections coupled to said sections of said inductance means to establish artificial electrical transmission line means having first and second terminal means corresponding to said first and second terminal means of said inductance means and having char-

acteristic impedances $Z_0$ related to $\sqrt{L/C}$ and phase constants related to $\sqrt{LC}$; and



means for coupling said first terminal means of said artificial transmission line means to signal processing means.

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**4,423,495**

## METHOD AND APPARATUS FOR RECORDING OPTICALLY AN INFORMATION SIGNAL ON A RECORD MEDIUM ALONG TRACKS

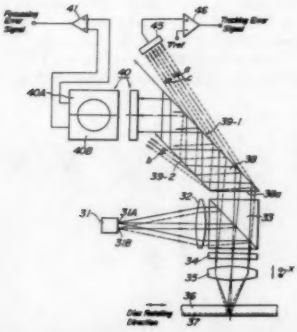
**Tohru Mushu; Kiichi Kato, and Kenichi Ito, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Japan**

**Filed Sep. 10, 1981, Ser. No. 301,098**

**Claims priority, application Japan, Sep. 12, 1980, 55-126965**

**Int. Cl.³ G11B *7/00***

**U.S. Cl. 369—45** **33 Claims**



1. A method for recording optically an information recorded on a record medium along tracks comprising

a step of generating at least two light beams;

a step of modulating at least one of said light beams with the information signal to be recorded;

a step of projecting said light beams onto said record medium by means of an objective lens in such a manner that said modulated light beam is positioned on an information track to be recorded and the other beam is situated on a previously recorded information track near the relevant information track to be recorded or a previously formed tracking track;

a step of converting each of the light beams reflected by the record medium and collected by said objective lens into a parallel light flux;

a step of separating spatially said light beams from each other by introducing these light beams into an optical member having a reflection surface which is set substantially at a critical angle with respect to one of the beams referred to as a main beam, but at an angle smaller or larger than said critical angle with respect to the other beam referred to as a sub beam; and

a step of receiving the thus spatially separated main and sub beams by at least two separate light detectors to generate a focussing error signal of said objective lens with respect to the record medium and a tracking error signal of the modulated light beam with respect to the track to be recorded.

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**4,423,496**

## APPARATUS FOR READING AND/OR WRITING AN OPTICALLY READABLE INFORMATION STRUCTURE

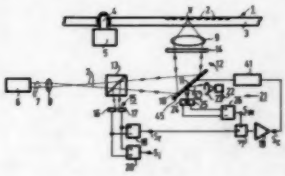
**Willem G. Opheij, and Gerard E. Van Rosmalen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Dec. 10, 1980, Ser. No. 214,938**

**Claims priority, application Netherlands, Oct. 13, 1980, 8005633**

**Int. Cl.³ G11B *7/00, 21/10***

**U.S. Cl. 369—46** **7 Claims**



1. An apparatus for reading and/or writing an optically readable track-wise arranged information structure on a record carrier, which apparatus comprises a radiation source which produces an optical beam, an objective system for focusing the beam to a radiation spot in the plane of the information structure, an adjustable element for moving the radiation spot transversely of the track direction, and a tracking servo system for generating a control signal for the adjustable element, said servo system including a first detection system for detecting deviations of the spot transversely of the track direction, said first detection system producing a tracking signal indicative of said deviations, characterized by a position detection system **(21, 22, 23, 24, 25, 26)** for determining the position of the adjustable element **(10, 30, 36)**, the output of said position detection system being connected to an input of the tracking servo system **(16, 17, 18, 27)** so that the control signal $(s_c)$ is generated in dependence on the tracking signal and is corrected with respect to said position.

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**4,423,497**

## ROTARY RECORDING MEDIUM REPRODUCING APPARATUS CAPABLE OF PERFORMING SPECIAL REPRODUCTION

**Hiroyuki Sugiyama, Isehara; Masaki Sakurai; Ryozo Abe, both of Yokohama, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed Oct. 9, 1981, Ser. No. 310,129**

**Claims priority, application Japan, Oct. 13, 1980, 55-142751**

**Int. Cl.³ G11B *21/08*; H04N *5/781***

**U.S. Cl. 369—47** **6 Claims**

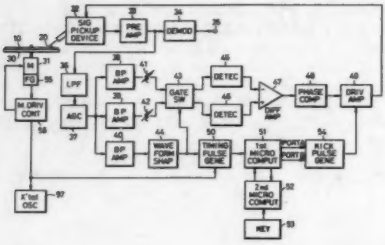
1. A reproducing apparatus for reproducing signals from a rotary recording medium, said rotary recording medium having an information signal recorded on a spiral track and at least

one reference signal recorded at a predetermined position on each track turn of said rotary recording medium, said reproducing apparatus comprising:

a reproducing transducer means comprising a reproducing element for reproducing signals from tracks on said rotary recording medium and kicking means for kicking said reproducing element to an adjacent track in response to a kick pulse;

timing pulse generating means for generating timing pulses according to the reproduced reference signal, a number of the generated timing pulses being equal to a maximum number of kicking positions for one track turn of said rotary recording medium;

mode setting means for manually setting an operating mode of said reproducing apparatus to one of special reproduction modes;



first judging means for judging the mode of said reproducing apparatus according to the mode set by said mode setting means;

second judging means coupled to said timing pulse generating means and said first judging means, for judging whether a kick pulse is to be generated within an interval in correspondence with a subsequent timing pulse and for producing pulse signals according to a judgment result obtained during an interval in correspondence with a preceding timing pulse, with respect to each of said timing pulses from said timing pulse generating means according to the judgment result from said first judging means; and

kick pulse generating means for generating kick pulses in accordance with the pulse signals supplied from said second judging means, said kick pulses being supplied to said reproducing transducer to kick said reproducing element according to the set special reproduction mode of said reproducing apparatus.

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**4,423,498**

## CONTROL APPARATUS FOR A RECORDING MEDIUM DRIVE MOTOR IN A DIGITAL INFORMATION REPRODUCING APPARATUS

**Hiroyuki Kimura, Yokohama; Shin-ichi Ohashi, Chigasaki, and Keizo Nishimura, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 13, 1981, Ser. No. 311,048**

**Claims priority, application Japan, Oct. 13, 1980, 55-142088; Oct. 13, 1980, 55-142094**

**Int. Cl.³ G11B *19/24***

**U.S. Cl. 369—47** **12 Claims**

1. A control apparatus for a recording medium drive motor in a digital information reproducing apparatus comprising:

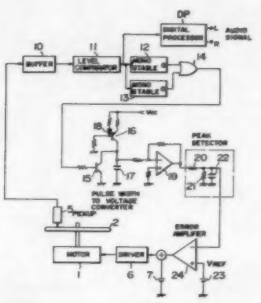
(a) pickup means for reproducing a digital signal from said recording medium having a digital information recorded thereon in the form of a signal sequence modulated with a predetermined plural number of pulse widths;

(b) transition point detection means for detecting rising edges and falling edges of the reproduced digital signal to detect signal transition points;

(c) counter means responsive to the output from said transition point detection means for counting a length of an input pulse width;

(d) first latch means for reading in the content of said counter means and holdng a count corresponding to a maximum pulse width of the input pulse widths;

(e) compare means for comparing input value and output value of said first latch means and loading the content of said counter means to said first latch means when the input value from said counter means is larger than the output value of said first latch means;



(f) second latch means adapted to receive the content of said first latch means and holding a maximum count of the counts in said counter means in a predetermined period;

(g) clock rate error signal generating means for comparing the output of said second latch means with a reference value corresponding to a predetermined maximum pulse width to produce an error signal for the clock rate; and

(h) drive means responsive to the output of said clock rate error signal generating means for producing a drive output to drive said recording medium drive motor.

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**4,423,499**

## PICKUP ADJUSTING EQUIPMENT

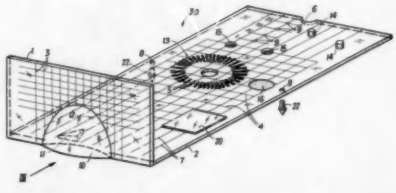
**Karl Peschel, Vienna, Austria, assignor to AKG Akustische u.Kino-Geräte Gesellschaft m.b.H., Austria**

**Filed Aug. 7, 1981, Ser. No. 291,121**

**Claims priority, application Austria, Nov. 8, 1980, 4118/80**

**Int. Cl.³ G11B *3/10***

**U.S. Cl. 369—55** **14 Claims**



1. A device for adjusting a pickup carrying a stylus and a pickup arm of a record player, of the type adapted to be received on a turntable of the record player, which turntable includes a spindle, comprising:

a structure having a first plain surface part adapted to lie on the turntable and a second plain surface part so connected to said first plain surface part to form an L-shaped structure, with said second plain part adapted to extend up from the turntable;

a contact point on said first plain surface part for receiving the stylus, said first plain surface part being longer than said second plain surface part; and

orienting means on said structure for comparing the position of the pickup and the pickup arm relative thereto when the stylus is received on contact point, said orienting means comprising parallel lines on said first and second plain surface parts with said second plain surface part being made of transparent material so that the stylus on the contact point can be viewed and aligned through said second plain surface part;

said longer first plain surface part having an edge opposite said second plain surface part with a recess at a center of said edge for engaging against the turntable spindle when the first plain surface part is on the turntable for adjusting the pickup.

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**4,423,500**

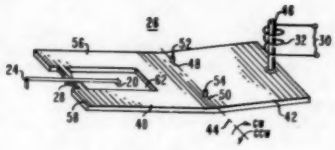
## STYLUS LIFTING/LOWERING ACTUATOR WITH AIR DAMPING

**Anil R. Dholakia, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Sep. 8, 1981, Ser. No. 300,120**

**Int. Cl.³ G11B *17/06***

**U.S. Cl. 369—230** **11 Claims**




1. In a playback system for recovering prerecorded information from a record, said record being rotatably supported on a turntable, said system including a support member and a stylus arm having a pickup stylus mounted at one end of said arm, said arm being secured at the other end to said support member, the apparatus comprising:

a frame having first and second flat portions, said first portion lying in a first plane and said second portion lying in a second plane at an angle to said first plane;

means connected to said first portion and adapted to receive said stylus arm;

coupling means coupled to the intersection of said first and second positions for forming a pivot axis for allowing rotational motion of said frame about said axis, said coupling means being arranged relative to said support member with said rotational axis arranged so that one of said first and second flat portions lies substantially flat against said support member at the extreme of rotation of said frame in a manner tending to create a vacuum between said support member and said first flat portion, and pressure between said support member and said second flat portion for a first direction of rotation of said frame, and tending to create pressure and vacuum between said support member and said first and second flat portions, respectively, for a second direction of rotation; and

means for effecting rotational motion of said frame whereby said pressure and vacuum tend to damp the rotation.

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**4,423,501**

## PHONOGRAPH TONE ARM SUSPENSION

**Thomas L. Cadawas, 92 Onedia Ave., Staten Island, N.Y. 10301**

**Filed Apr. 23, 1981, Ser. No. 257,943**

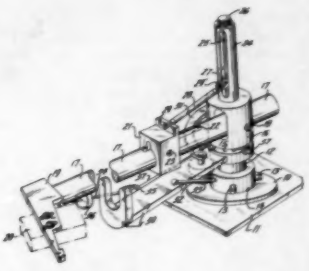
**Int. Cl.³ G11B *17/02***

**U.S. Cl. 369—253** **6 Claims**

1. A suspension system for a phonograph tone arm which is operable to carry a pick-up cartridge and is pivotably mounted on a base for rotational movement about vertical and horizontal axes, the system comprising

(a) first attachment means mechanically linked to said tone arm and providing a plurality of attachment positions along a portion of a first line, each attachment position being operable upon application of a sufficient supporting force to counterbalance the rotational displacement under the influence of gravity of the tone arm within the plane of its rotational movement about its horizontal axis;

(b) second attachment means operable to provide a plurality of attachment positions along a portion of a second line which second line lies in said plane of the tone arms's rotation but is transverse to said first line;



(c) support means for said second attachment means; and

(d) an elongated resilient member diagonally attached between said first and second attachment means for tensional support of said tone arm, the effective mechanical compliance exhibited by the resilient member with respect to rotational movement of the tone arm and any pick-up cartridge associated therewith being dependent upon the relative positions of said first and second attachment means on said first and second lines.

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**4,423,502**

## RECORD CARRIER HAVING AN OPTICALLY READABLE INFORMATION STRUCTURE

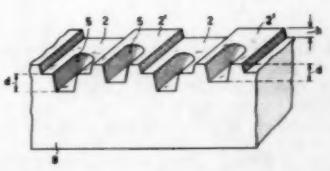
**Jan G. Dil, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Sep. 11, 1981, Ser. No. 301,155**

**Claims priority, application Netherlands, Jan. 12, 1981, 8100098**

**Int. Cl.³ G11B *7/24***

**U.S. Cl. 369—275** **12 Claims**




1. A record carrier comprising a planar substrate provided with an information structure having a plurality of elongated, generally parallel tracks, at least a portion of each track having a plurality of information areas which are spaced apart in the track direction by intermediate areas, said information areas in all of said portions being of the same type and differing in the same way from said intermediate areas such that when said portions are scanned by a read beam of radiation focussed to a spot thereon, said information and intermediate areas modulate the radiation in accordance with information stored therein, the portions of adjacent tracks which also are adjacent each other in a direction transverse to the track direction being disposed in different planes which are parallel to the plane of said substrate and are spaced from each other in a direction

normal thereto by an effective distance which is a fraction of the effective wavelength of the radiation with which the information is to be read such as to reduce crosstalk between said adjacent portions during readout of the information.

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**4,423,503**

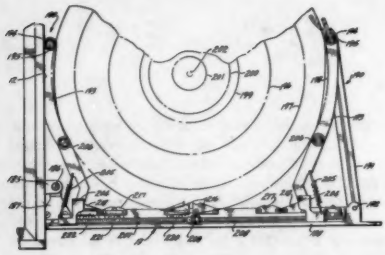
## MAGNETICALLY RECORDABLE LABEL FOR MECHANICALLY-DEFINED INFORMATION BEARING DISCS

**Robert G. Cheeseboro, 3650 Somerset Dr., Los Angeles, Calif. 90016**

**Division of Ser. No. 164,922, Jul. 1, 1980, Pat. No. 4,302,832, which is a division of Ser. No. 951,563, Oct. 16, 1978, Pat. No. 4,222,574, which is a division of Ser. No. 778,027, Mar. 16, 1977, Pat. No. 4,121,836. This application Nov. 19, 1981, Ser. No. 322,948**

**Int. Cl.³ G11B *3/68***

**U.S. Cl. 369—290** **8 Claims**



1. A method for controlling the playback of a record disc in a record player, such a record disc comprising a central portion and an annular portion surrounding the central portion, the annular portion containing recorded material for playback by the record player, the method comprising:

providing a band of machine readable medium on the central portion of the record disc; and

encoding playback instructions on the band which are descriptive of the location and length of at least one passage of recorded material on the annular portion, such playback instructions when received by the record player in use of the record directing the sequence of play of the passages by the player.

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**4,423,504**

## HEIGHT POSITION ADJUSTING DEVICE FOR A REPRODUCING TRANSDUCER IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

**Takashi Saito, Ayase, and Hiroshi Kumei, Yamato, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed Aug. 4, 1981, Ser. No. 289,930**

**Claims priority, application Japan, Aug. 6, 1980, 55-107928; Aug. 6, 1980, 55-111330[U]**

**Int. Cl.³ G11B *3/10, 21/24***

**U.S. Cl. 369—292** **1 Claim**

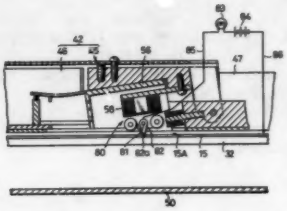
1. A height position adjusting device for a reproducing transducer means used in connection with a rotary recording medium reproducing apparatus, said transducer means reproducing an information signal recorded on a rotary recording medium and comprising a pickup cartridge said reproducing apparatus comprising means for transferring the transducer means in the radial direction across said rotary recording medium, said height position adjusting device comprising:

guide means in said reproducing apparatus;

carriage means for supporting said reproducing transducer means, said carriage moving along said guide means of said reproducing apparatus; said carriage having a basepart and

height position adjusting means for adjusting the height position of said reproducing transducer means with respect to said rotary recording medium, by varying the height position of said carriage with respect to said guide means,

said height position adjusting means comprising an arm having one end pivotally supported by said basepart of said carriage, adjusting screw means for adjusting a distance between said arm and the base part of said carriage, and a roller making contact with said guide means;



detecting means responsive to said height position adjusting means for detecting that said carriage has been adjusted to a predetermined height position with respect to said rotary recording medium,

said detection means comprising a reference member and a contact member which makes electrical contact with said reference member when said carriage reaches a predetermined height position,

said contact member being provided within a dummy pickup cartridge in a freely rotatable manner, and said contact member hanging downwardly due to its own weight,

said dummy cartridge replacing said pickup cartridge of said reproducing transducer means upon height position adjustment of said reproducing transducer means.

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**4,423,505**

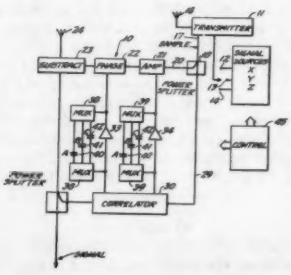
## CUED ADAPTIVE CANCELLER

**John H. Greig, Massapequa, N.Y., assignor to Loral Corp., Yonkers, N.Y.**

**Filed Nov. 23, 1981, Ser. No. 323,867**

**Int. Cl.³ H04B *1/56***

**U.S. Cl. 370—32** **3 Claims**



1. A cued adaptive canceller for use in conjunction with a radio receiver and a radio transmittor simultaneously operated in close proximity for cancelling reception of transmitted signals comprising: a cancelling loop including a connection to said transmittor to input sample transmitted signals, a phase control an amplitude control and a subtractor; said subtractor connected to an input to said receiver, and a cross correlator

having an input of received signals; first and second filters interconnecting the output of said cross correlator and said phase control and said amplitude control, respectively; a parameter multiplexer connected in parallel with each of said filters, and a plurality of capacitors each selectively interconnected in parallel with a respective filter by operation of one of said multiplexers; and control means for governing operation of said multiplexers.

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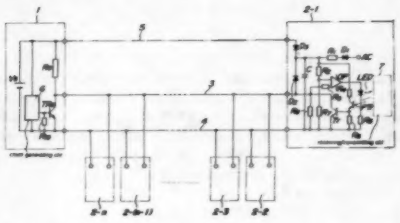
**4,423,506**

## WIRE DATA TRANSMISSION SYSTEM

**Kikuo Kawasaki; Tomomi Sano, and Kazuo Yoshida, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan**

**Filed Apr. 29, 1981, Ser. No. 253,838**
**Claims priority, application Japan, Aug. 29, 1979, 54-109019**
**Int. Cl.³ H04J 3/02; H04L 25/02**
**U.S. Cl. 370—85** **11 Claims**



1. A wire data collection system having a master station and a plurality of slave stations which are connected in common to said master station by a pair of signal lines, said wire data collection system comprising:

in said master station,

a power source for applying a DC voltage to one of said pair of signal lines via a resistor;

a first data transmission means for short-circuiting said pair of signal lines in accordance with a predetermined period in response to data from said master station to pulse-width encode said data from said master station by said short-circuiting so as to transmit an address signal designating one of said plurality of slave stations, and for subsequently transmitting a response clock pulse having said predetermined period to each of said plurality of slave stations; and

a first data reception means for detecting the change of a pulse width of a DC voltage on said one signal line when said response clock pulse is transmitted to receive data from the slave station designated by said address signal; and

in each of said plurality of slave stations,

means for detecting a change of a pulse width of a DC voltage across said pair of signal lines to identify said address signal;

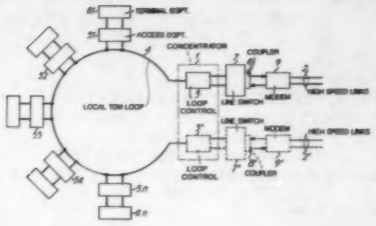
a second data transmission means for short-circuiting said pair of signal lines in synchronism with said response clock pulse when the slave station is designated by said address signal to encode said data from said slave station as a change of the pulse width of said response clock pulse so that said data from the designated slave station is transmitted to said master station.

**4,423,507**

## COMMUNICATIONS SYSTEM FOR INTERCONNECTING A PLURALITY OF ASYNCHRONOUS DATA PROCESSING TERMINALS

**Renoulin Roger, 29, rue Jean Mailleux, Thorigne/Vilaine, 35510 Cesson, and Jean Y. Le Brun, 34, Boulevard Clemenceau, 35100 Rennes, both of France**

**Filed Mar. 16, 1981, Ser. No. 244,066**
**Claims priority, application France, Mar. 20, 1980, 80 06774**
**Int. Cl.³ H04J 3/16, 6/00**
**U.S. Cl. 370—89** **2 Claims**



1. A communication system for connecting many asynchronous data processing terminals which are operating at different speeds to a high speed switching and communication network; said system comprising central control circuit means associated with microprocessor means and a plurality of secondary control circuit means; each of said secondary control circuit means being associated with a terminal which is connected to the central control circuit means by a telephone line; the central control circuit means being coupled via a high speed transmission link to the high speed switching and communication center by coupler means and line switch means; means responsive to the microprocessor means for controlling operation of said line switch means; the central control circuit means having central switching means which are capable of taking either a transmitting state or a receiving state; each secondary control circuit means also being able to assume either a receiving state or a transmitting state, means for synchronizing the central control circuit means and the secondary control circuit means for transmitting a sync burst; means for transmitting and receiving bytes of information one-by-one; the central control circuit means is also having addressing means for transmitting an address byte for selecting the secondary control circuit means which is to be interrogated; each of said secondary control circuit means having an address identification circuit means; the central control circuit means having a central sequencing unit means for:

(1) operating the switching means of the central control circuit to the transmitting state at the beginning of each interrogation sequence,

(2) coupling the synchronization means to the line by way of the said switching means,

(3) operating the addressing means,

(4) operating the byte transmission means,

(5) switching the switching means to the receiving state, and

(6) coupling the synchronization means to the line; each of said secondary control circuit means having a secondary sequencing unit for:

(a) switching the switching means of the secondary control circuit means between two interrogation sequences to the receiving mode,

(b) coupling the synchronization means to the line by way of said switching means,

(c) activating the secondary interrogation means in response to the sync burst to couple the address identification circuit to the line means (i) responsive to a negative addressing of a line for causing the isolation of said switching means from the line, and (ii) responsive to a

positive addressing of the line for activating a secondary ordering unit to link the byte receiving means to the line; means responsive to the ordering unit for:

(1) placing the switching means in the transmitting state,

(2) coupling the synchronization means of the secondary control circuit means to the line,

(3) coupling the byte transmitting means to the line,

(4) switching the switching means to the receiving mode; and

(5) means responsive to the synchronization means of the central control circuit means for coupling the byte receiving means to the line in response to the reception of the sync burst from the secondary control circuit means.

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**4,423,508**

**LOGIC TRACING APPARATUS**

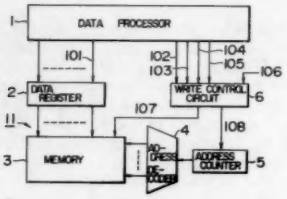
**Keniti Shiozaki, and Hazuo Hibi, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Sep. 18, 1981, Ser. No. 303,525**

**Claims priority, application Japan, Sep. 19, 1980, 55-129346**

**Int. Cl.³ G06F *11/10***

**U.S. Cl. 371—16** **3 Claims**




1. A logic tracing apparatus having a memory for successively storing hardware status information relating to operation of a data processor during execution of a test program by the data processor, said data processor including means for generating a stop signal on or before the start of a comparison routine in the test program for comparing a result of esecution of the test program with a predetermined result, a hold signal when an erroneous operation is detected by the execution of the result comparison routine and a start signal when said data processor restarts the operation thereof after the execution of the result comparison routine, said logic tracing apparatus comprising:

(a) data register means connected between said data processor and said memory for temporarily storing the hardware status information successively outputted from the data processor prior to the storing of said information in said memory;

(b) addressing means connected to said memory for applying an address to said memory at which the information within said data register means is to be stored in said memory; and

(c) control means connected to said data processor, said addressing means and said memory for generating a write enable signal to effect the storing of data from said data register means into said memory at the address specified by said addressing means, and including means for preventing the storing operation of the hardware status information from the data register into said memory in response to either one of said stop signal or said hold signal or both, said control means including means for allowing the storing operation of said information into said memory in response to said start signal when no hold signal is received, while preventing the storing operation of said information even in response to said start signal when said hold signal has been received.

**4,423,509**

**METHOD OF TESTING A LOGIC SYSTEM AND A LOGIC SYSTEM FOR PUTTING THE METHOD INTO PRACTICE**

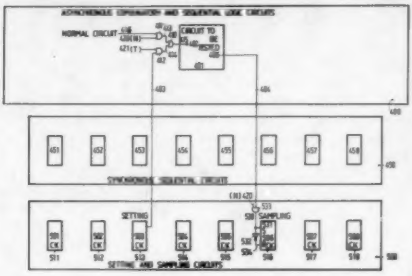
**M. Henri Feissel, Paris, France, assignor to Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme), Paris, France**

**Continuation of Ser. No. 61,006, Jul. 26, 1979, abandoned. This application May 26, 1981, Ser. No. 267,347**

**Claims priority, application France, Jul. 27, 1978, 78 22228**

**Int. Cl.³ G06F *11/22***

**U.S. Cl. 371—25** **22 Claims**



1. In combination with a logic system of the type having a combinational network and at least one synchronous logic circuit connected to particular points in said combinational network, the combinational network also having intermediate points not directly connected to the synchronous logic circuit and not directly accessible from the exterior of said logic system, a testing system comprising:

at least one flip-flop;

an externally accessible input line;

selective gating circuitry connected to said one flip-flop and arranged, when enabled in a series mode, to effectively connect a flip-flop input to said externally accessible input line such that when a signal is applied to said accessible input line and said flip-flop is clocked a particular logic state is loaded into said flip-flop; and

said selective gating circuitry being further arranged, when enabled in a setting test mode, to effectively connect a flip-flop output to one of said intermediate points in said logic system;

said testing system thereby permitting a particular logic state to be serially fed in and applied to said one of said intermediate points.

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**4,423,510**

**LASER TUBE DESIGN INCORPORATING LOW INDUCTANCE CAPACITOR**

**John L. Pack; Roy K. Williams, both of Murrysville, and Chi-Sheng Liu, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

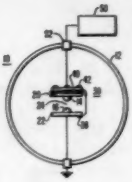
**Continuation-in-part of Ser. No. 67,250, Aug. 17, 1979, abandoned. This application Nov. 18, 1981, Ser. No. 322,620**

**Int. Cl.³ H01S *3/097***

**U.S. Cl. 372—82** **5 Claims**

1. In a metal halide laser apparatus including spaced-apart electrode means positioned within a laser housing containing a metal halide laser medium and defining a laser discharge region therebetween, and electrical excitation means operatively connected to said electrode means for exciting said metal halide laser medium by electrical discharge to produce a laser radiation output from appropriate laser optics associated with said laser housing, the improvement for improving laser operation by minimizing the inductance of the laser assembly, said improvement comprising:

a capacitor means positioned within said laser tube housing and connected to said spaced-apart electrode means and extending approximately the entire length of said electrode means to minimize the inductance of the laser apparatus, said capacitor means consisting of alternate layers of metal and dielectric insulator, said metal and dielectric insulator being



materials capable of withstanding the chemically corrosive gas environment of said metal halide laser medium at elevated temperatures, said metal being selected from a group consisting of gold, platinum, graphite and stainless steel, and said dielectric insulator being selected from a group consisting of a polyimide film and quartz.

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**4,423,511**

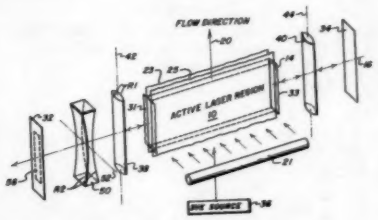
**UNSTABLE WAVEGUIDE LASER RESONATOR**

**Richard G. Morton, Richland, Wash., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.**

**Filed Apr. 16, 1981, Ser. No. 254,643**

**Int. Cl.³ H01S *3/08***

**U.S. Cl. 372—95** **16 Claims**




1. A system of cavity components for use in a laser comprising:

an active laseable medium having an optical axis passing through said laseable medium;

said laseable medium having a thin dimension orthogonal to said optical axis and extending a predetermined distance along said optical axis;

said thin dimension being of a size to generally favor the propagation of waves therethrough whereby said medium acts as a waveguide;

means for reflecting laser radiation of said medium repeatedly through said medium; and

a negative lens having foci lying along a line in the direction of said thin dimension, said lens being positioned between said reflecting means and said medium for diverting in said thick dimension beams travelling through said medium during each pass so that with each subsequent pass, each beam is displaced from its position in a previous pass for providing beam walking which results in optical coupling of separated portions of said medium together, whereby laser radiation from said medium has a divergence characteristic of the cross-sectional area of said medium transverse to said optical axis as opposed to a divergence characteristic of plural bands of radiation.

**4,423,512**

**PLASMA MELTING FURNACE**

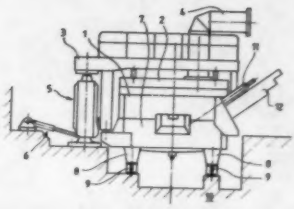
**Walter Lugscheider, Linz; Ernst Riegler, Enns, and Ernst Zajicek, Ottensheim, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria**

**Filed Jan. 4, 1982, Ser. No. 336,899**

**Claims priority, application Austria, Jan. 8, 1981, 31/81**

**Int. Cl.³ H05H *1/00***

**U.S. Cl. 373—22** **10 Claims**



1. In a plasma melting furnace of the type including a water-cooled bottom electrode made of copper, a temperature probe connected to said bottom electrode, and a wearing part of steel for covering said bottom electrode in the bottom of said plasma melting furnace, at least one counter electrode being arranged at a distance above said wearing part and adapted to form a plasma jet, the improvement comprising a metal layer provided between said bottom electrode and said wearing part, said metal layer being composed of a metal having a low thermal conductivity and a low melting point, as compared to copper, as well as a high melting enthalpy.

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**4,423,513**

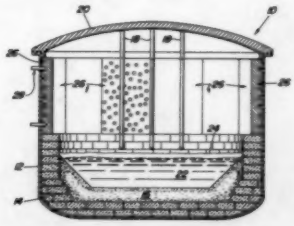
**FURNACE PANEL FOR USE IN AN ARC FURNACE**

**James E. De Long, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.**

**Filed Jun. 28, 1982, Ser. No. 393,007**

**Int. Cl.³ F27D *1/12***

**U.S. Cl. 373—76** **2 Claims**



1. A furnace panel for use in an arc furnace comprising:

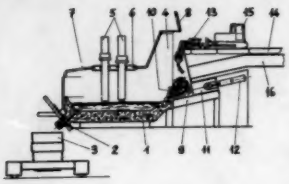
(a) a cast iron block having an inner and an outer surface and which encloses cooling coils between said surfaces, said block having at least one anchoring member projecting outward from said outer surface for retaining said block to a wall of said furnace; and

(b) steel bars fully embedded in said block and having a plurality of steel studs projecting outward therefrom which extend at least twenty-five percent of their length beyond said inner surface of said block, said studs having a profile which enhances containment of molten slag against said inner surface of said block during furnace operation to prolong the life of said block.

## 4,423,514
## CONTINUOUSLY FED ELECTRIC FURNACE FOR MELTING SCRAP IRON

Jean Duvene, Villars, France, assignor to Clesid S. A., Saint-Chamood, France

Filed Nov. 30, 1981, Ser. No. 325,951
Claims priority, application France, Jan. 20, 1981, 81 00996
Int. Cl.³ F27D *3/04*
U.S. Cl. 373—79 3 Claims



1. Electric melting furnace with continuous feeding and hearth fixed in position, comprising

(a) an inner chamber comprising an area directly above said hearth and a contiguous storage space (4) open to and lateral to said space and above the level of said hearth (1), said space being arranged for the storage of a large quantity of large size scrap iron;

(b) a pusher (11) located at the bottom of said storage space for pushing the base of a pile (10) of scrap iron stored in said space towards said hearth; and

(c) an opening (8) of the trap or door type at the upper part of said storage space for the selective feeding of cold scrap iron (13, 131) therethrough;

(d) said storage space being connected to a conduit for exhausting the fumes of said furnace so that said fumes are caused to pass through the latter.

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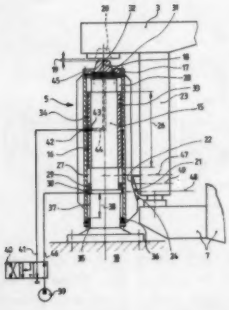
## 4,423,515
## ELECTRIC FURNACE

Ernst Riegler, Enns, and Ernst Zajicek, Ottensheim, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jan. 4, 1982, Ser. No. 336,896
Claims priority, application Austria, Jan. 8, 1981, 30/81
Int. Cl.³ F27D *1/18*
U.S. Cl. 373—81 8 Claims



1. In a lifting means for raising and lowering a furnace cover of an electric furnace, such as an electric arc furnace, a plasma melting furnace and the like, of the type including a base and a cover carrying structure carrying said furnace cover, said cover lifting means including a king post supported on said base, a sleeve surrounding said king post and adapted to be raised and lowered hydraulically relative to said king post for engagement with said cover carrying structure, and a cap provided on said sleeve on its upper end, the improvement comprising

a front face on said king post said front face and said cap defining a cylindrical space therebetween,

means for supplying an hydraulic medium to said cylindrical space to raise said sleeve relative to said king post thereby to raise said furnace cover,

a collar provided on said king post,

a first annular space between said collar and the inner wall of said sleeve,

means for supplying an hydraulic medium to said first annular space to lower said sleeve thereby to lower said furnace cover,

an upper bearing bush and a lower bearing bush arranged between said king post and said sleeve defining a second annular space extending therebetween, and

a bore in said king post connecting said second annular space with said cylindrical space between said front face and said cap.

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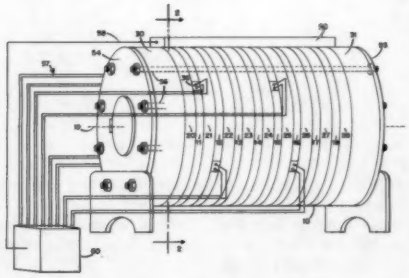
## 4,423,516
## DYNAMIC GRADIENT FURNACE WITH CONTROLLED HEAT DISSIPATION

Robert H. Mellen, Sr., P.O. Box 535, New London, N.H. 03257

Filed Mar. 22, 1982, Ser. No. 360,327
Int. Cl.³ F27B *5/00*
U.S. Cl. 373—111 6 Claims



1. A furnace having an interior space extending along an axis and a series of heating elements each oriented normal to said axis and extending around said space for providing controllable temperature gradients in said space comprising:

(a) A plurality of thermally conductive annuli;

(b) A plurality of thermally insulating layers separating said annuli and having central apertures defining said interior space;

(c) A plurality of heating elements, each sandwiched between two of said insulating layers and thermally coupled to a respective one of said annuli;

(d) Securing means securing said annuli, layers and elements together to enclose said interior space; and,

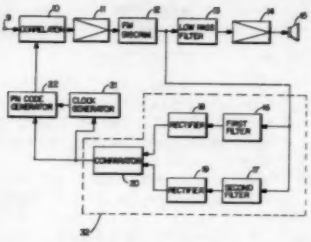
(e) Control means controllably connecting each of said elements to a source of energy.

4,423,517

## CODE SEQUENCE SYNCHRONIZATION SYSTEM FOR SPREAD SPECTRUM COMMUNICATION RECEIVER

Tsuneo Daino, Moriguchi; Masashi Kanno, Katano, and Eichiro Murata, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 19, 1981, Ser. No. 226,472
Claims priority, application Japan, Jan. 21, 1980, 55-6212
Int. Cl.³ H04K 1/04
U.S. Cl. 375—1 2 Claims




1. A spread spectrum receiver for receiving a spread spectrum signal, comprising:

a correlating means for correlating a pseudonoise code with a received signal spectrum signal so as to collapse the spread spectrum of the received signal;

a demodulating means coupled to said correlating means for demodulating the thus collapsed received signal;

a detecting means coupled to said demodulating means for detecting synchronization between said pseudonoise code and said demodulated collapsed received signal;

a clock pulse generating means coupled to said detecting means for generating a clock pulse which is the same as that of said received signal when said pseudonoise code and said demodulated received signal are synchronized with each other, and which has a clock rate which has a small offset from that of said demodulated received signal so as to search the synchronization when said pseudonoise code and said demodulated received signal are out of synchronization with each other; and

a pseudonoise code generating means coupled to said detecting means and also coupled to and driven by said clock pulse generating means for generating said pseudonoise code so as to restore the relative position between said pseudonoise code and a pseudonoise code of said demodulated received signal at least before a time that the synchronization has been detected by said detecting means;

wherein said detecting means comprises: a first filter for extracting a noise component from the output of said demodulating means in order to ensure the detecting of said synchronization;

and wherein said detecting means further comprises: a second filter for extracting a pilot signal component from the output of said demodulating means, and a comparator for comparing said noise component with said pilot signal component in order to ensure the detecting of said synchronization.

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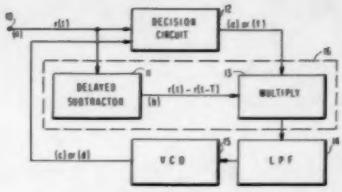
4,423,518

## TIMING RECOVERY CIRCUIT

Botaro Hirosaki, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 18, 1982, Ser. No. 379,408
Claims priority, application Japan, May 19, 1981, 56-74301; May 19, 1981, 56-74302
Int. Cl.³ H04L 7/02
U.S. Cl. 375—20 7 Claims

3. A timing recovery circuit for a receiver for receiving pulse-amplitude-modulated (PAM) signals, said recovery circuit comprising: delayed difference means for generating a delayed difference signal corresponding to the differences between a received PAM signal and a delayed version of said received PAM signal; control means for generating a control signal from said delayed difference signal in accordance with a decision signal; timing signal generating means for generating




a timing signal having a frequency determined in accordance with the average value of the output of said control means; and decision means for comparing said reception signal to a threshold level at time instants determined by said timing signal and generating said decision signal in accordance with said comparisons.

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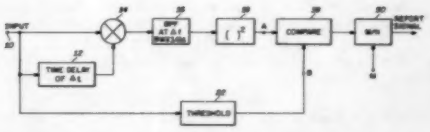
4,423,519

## APPARATUS AND METHOD FOR DETECTING THE ONSET OF A FREQUENCY SHIFT KEYED SIGNAL

Clarence L. Bennett, Jr., Groton, and Robert Price, Lexington, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 20, 1982, Ser. No. 340,941
Int. Cl.³ H03D 3/06
U.S. Cl. 375—80 50 Claims




26. An apparatus for detecting the presence in an incoming signal of a frequency shift keyed signal of known shift frequency, key rate, and key period that comprises

(a) first means for time delaying the incoming signal by a first time interval and for providing a first time delayed signal;

(b) first means for multiplying the incoming signal by the first time delayed signal to produce a first product;

(c) first means for filtering the first product to pass a first filtered signal of frequency substantially equal to the shift frequency;

(d) means for producing a threshold signal in response to the incoming signal;

(e) means for producing a report signal when the first filtered signal exceeds the threshold signal.

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4,423,520

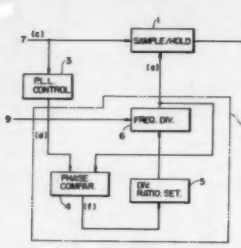
## QUANTIZATION CIRCUIT FOR IMAGE DATA TRANSMISSION SYSTEM

Tomio Murayama; Kenji Koguchi, both of Kanagawa; Shigehumi Takeuchi, and Kazumi Tsukioka, both of Nagano, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1980, Ser. No. 217,303
Claims priority, application Japan, Dec. 18, 1979, 54-163596
Int. Cl.³ H03L 7/06
U.S. Cl. 375—95 6 Claims

1. A signal receiver quantization circuit for an image data transmission device in which an input signal which is quantized

and transmitted by a signal transmissions side is quantized in a signal receiver comprising: a digital PLL circuit; a sampling clock producing an output signal; a PLL control circuit for detecting transition times of an input received signal; said digital PLL circuit being controlled in accordance with an




output signal of said PLL control circuit; and means for sampling said input signal in response to said sampling clock output signal of said digital PLL circuit, said sampling clock output signal is produced as a direct function of the previous transition pulse period such that

$$e_n - d_n = t_{\frac{n-1}{2}},$$

where $e_n$ is said sample pulse, $d_n$ is said transition pulse and $t_{n-1}$ is the previous transition pulse period.

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**4,423,521**

**DIAGNOSTIC X-RAY INSTALLATION COMPRISING A CONTROL LOOP FOR THE EXPOSURE CONTROL**

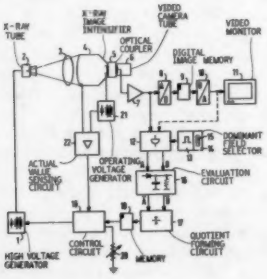
**Joerg Haendle, Erlangen, and Wolfgang Maass, Nuremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Jan. 28, 1982, Ser. No. 343,535**

**Claims priority, application Fed. Rep. of Germany, Feb. 23, 1981, 3106627**

**Int. Cl.³ G03B *41/16***

**U.S. Cl. 378—108** **10 Claims**




1. A diagnostic X-ray installation comprising an X-ray tube, an image intensifier television chain which includes an X-ray image intensifier (4), an optical coupler (5), a camera tube (6), a video amplifier (7), and a monitor (11), and comprising a control circuit for exposure control which includes a control circuit (19) for the formation of a control voltage for controlling the dose rate of the X-ray tube, a setpoint value transmitter (20) for supplying a setpoint value signal, and circuit means (12 through 18) comprising an evaluation circuit (16) and a device (12 through 15) for blanking out portions of the video signal to supply an output signal for representing a dominant field, characterized in that an actual value transmitter (22) is present which supplies to the control circuit (19) an actual value signal corresponding to the mean image intensity, and that, in the control circuit (19), the actual value signal, the setpoint value signal, and the output signal of the circuit means (12 through 18) are superimposed to form a resultant correction value.

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**4,423,522**

**DEVICE FOR THE IMAGING OF BODY LAYERS BY MEANS OF MONOENERGIC RADIATION**

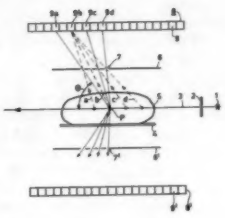
**Geoffrey Harding, Halstenbek, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Jun. 15, 1981, Ser. No. 273,547**

**Claims priority, application Fed. Rep. of Germany, Jun. 21, 1980, 3023263**

**Int. Cl.³ G01N *23/20***

**U.S. Cl. 378—87** **4 Claims**



1. A device for determining the internal structure of a body, comprising:

radiation source means which generate a narrow monoenergic primary beam of radiation which penetrates the body;

diaphragm means disposed adjacent the path of the primary beam which define a plurality of adjacent, parallel, longitudinal slits which extend in a direction transverse to the primary beam;

detector means which extend transverse to the direction of the slits and which comprise a plurality of separate detectors which detect scatter radiation, which radiation is produced in the body by the primary beam and has passed through the slits, and which produce energy-dependent detector signals in response thereto;

energy discrimination means which process the detector signals from each detector to produce separate discriminator output signals for each of a plurality of scatter radiation energies detected thereby;

selector means which sum signals in preselected groups of the discriminator output signals each group being selected to contain signals produced by scatter radiation which originates in a separate region of the primary radiation beam; and

means which display the summed signals as a representation of the internal body structure.

# DESIGNS

DECEMBER 27, 1983

271,914

JAPANESE SHAO-MAI

Koki Uno, Tokyo, Japan, assignor to 501 Kyotaru Co., Ltd., Tokyo, Japan

Filed Jan. 2, 1981, Ser. No. 222,166

Term of patent 14 years

Int. Cl. D01—*01*

U.S. Cl. D1—2

271,915

WET SUIT OR SIMILAR ARTICLE

Jan I. H. Bengtson, Pl. 6715, 430 41 Kullavik, Sweden

Filed Nov. 5, 1980, Ser. No. 204,157

Claims priority, application Sweden, May 6, 1980, 80-0927

Term of patent 14 years

Int. Cl. D2—*02*

U.S. Cl. D2—29

271,916

AUTOMOBILE TOOL KIT CONTAINER

Adolf Koch, Waiblingen-Neustadt, Fed. Rep. of Germany, assignor to Autohaus Lorinser GmbH & Co, Waiblingen, Fed. Rep. of Germany

Filed Jul. 15, 1981, Ser. No. 283,680

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1981, 844

Term of patent 14 years

Int. Cl. D3—*02*

U.S. Cl. D3—40

271,917

COMBINED TRAVEL BAG FOR CHILDRENS' TOYS AND LAP DESK

Vicki C. Magis, 7235 Duncourtney Dr., Atlanta, Ga. 30328

Filed Feb. 11, 1982, Ser. No. 348,135

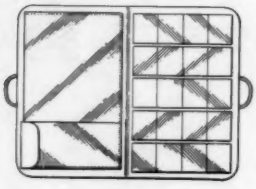
Term of patent 14 years

Int. Cl. D3—*01*

U.S. Cl. D3—40

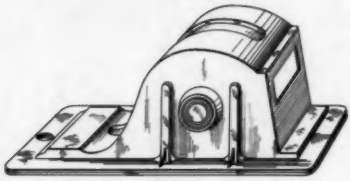
271,918
CARRYING CASE FOR A CIRCULAR SAW BLADE
Mike H. Ramirez, 11555 Baylor Dr., Norwalk, Calif. 90650
Filed Aug. 17, 1981, Ser. No. 293,542
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—73

271,919
FOLDABLE DISPLAY CASE
Mary E. Duffy, 1210 Main St., Natchez, Miss. 39120
Filed Feb. 27, 1981, Ser. No. 238,674
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—74

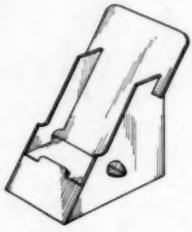


271,920
GROUND INSERTED SUPPORT STAND FOR A GOLF BAG
Edward F. Sanker, 319 Beech Ave., Wyoming, Ohio 45215
Filed Oct. 23, 1981, Ser. No. 314,187
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—28

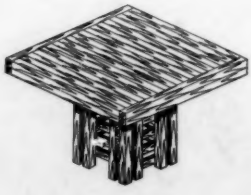
271,921
SOAP TAPE DISPENSER
Byung E. Yoo, #616-5,, Daemyung-dong, Nam-ku, Daegu-si, Rep. of Korea
Filed Oct. 21, 1981, Ser. No. 313,485
Claims priority, application Rep. of Korea, Jun. 12, 1981, 81-4745
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95



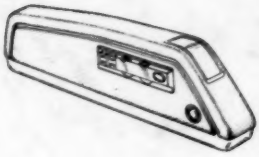
271,922
DISPLAY HOLDER
John L. M. Branagan, Victoria, Australia, assignor to Beatrice Publishing Pty. Ltd., Victoria, Australia
Filed Dec. 16, 1980, Ser. No. 216,807
Term of patent 14 years
Int. Cl. D20—*02*; D6—*04*
U.S. Cl. D6—140



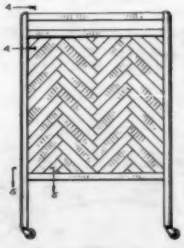
271,923
TABLE
Robert V. Thompson, Boatyard Condominiums, 75th Ave. North, Myrtle Beach, S.C. 29577
Filed Apr. 23, 1981, Ser. No. 256,793
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



271,924
ARM REST WITH AUDIO CONTROL PANEL
Teruyuki Nishimoto, Hirakata, and Akio Ohno, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 6, 1981, Ser. No. 309,133
Claims priority, application Japan, Apr. 8, 1981, 56-15036
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194

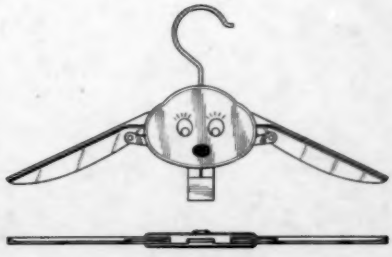


271,925
CRIB FOOTBOARD
Merlin A. Brunner, New London; Harvey J. Drabeim, Weyauwega, and Michael J. Schaffer, New London, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Mar. 23, 1981, Ser. No. 246,358
The portion of the term of this patent subsequent to Jul. 19, 1997, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—198



271,926
PICTURE FRAME
Donald K. Sultan, 54 Leonard St., New York, N.Y. 10013
Filed May 4, 1981, Ser. No. 260,109
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—244

271,927
FOLDING GARMENT HANGER
Noel M. Payant, 214 E. Pleasant, Taylorville, Ill. 62568
Filed Aug. 5, 1981, Ser. No. 290,368
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—250



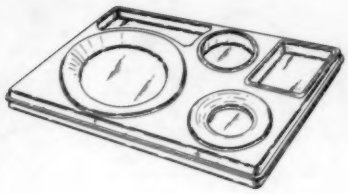
271,928
GOBLET OR SIMILAR ARTICLE
Henri Prieur, Reims, France, assignor to Societe Francaise des Verreries Mecaniques Champenoises, Reims, France
Filed Jul. 31, 1981, Ser. No. 288,863
Claims priority, application France, Mar. 3, 1981, 81 51
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—13

271,929
PLATE OR THE LIKE
Candace M. Faber, Corning, N.Y., and Loretta H. Moskal, Glen Riddle, Pa., assignors to Corning Glass Works, Corning, N.Y.
Filed Sep. 8, 1981, Ser. No. 299,802
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—24

271,930
PLATE OR THE LIKE
Donna M. Miska, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Aug. 31, 1981, Ser. No. 297,702
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—34

271,931
PLATE OR THE LIKE
Candace M. Faber, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Aug. 3, 1981, Ser. No. 289,262
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—36

271,932
FOOD TRAY
James M. V. Mosley, Hartford House, Occupation Rd., Lindley, Huddersfield, West Yorkshire, England
Filed Sep. 14, 1981, Ser. No. 301,857
Claims priority, application United Kingdom, Mar. 23, 1981, 999581
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—38



271,933
TRANSFER SURFACE OR THE LIKE FOR CULINARY WARE
Donna M. Miska, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Aug. 31, 1981, Ser. No. 297,961
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—39

271,934
TRANSFER SURFACE OR THE LIKE FOR CULINARY WARE
Candace M. Faber, Corning, N.Y., and Loretta H. Moskal, Glen Riddle, Pa., assignors to Corning Glass Works, Corning, N.Y.
Filed Sep. 8, 1981, Ser. No. 299,803
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—39

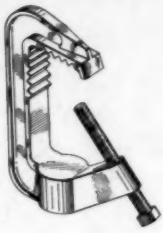
271,935
OUTDOOR COOKING APPLIANCE FOR USE WITH A GAS CONTAINER
Curtis G. Conner, 618 First St., #102, Humble, Tex. 77338
Filed Feb. 17, 1981, Ser. No. 235,121
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—332

271,936
FIREPLACE TOOL
Tulia J. Fyffe, 543 E. Country Line Rd., and Sandra L. Hicks, 1287 E. County Line Rd., both of Springfield, Ohio 45502
Filed Jan. 8, 1981, Ser. No. 223,459
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8--14

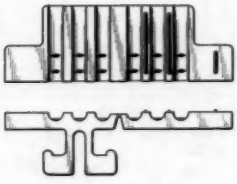
271,937
TOOL HANDLE
Marvin Combs, 2327 Mayhew Dr., Indianapolis, Ind. 46227
Filed Feb. 2, 1981, Ser. No. 230,644
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—25

271,938
ORNAMENTAL DESIGN FOR A SOLDER EXTRACTOR
Frank Sylvia, Columbia, Md., assignor to Pace Incorporated, Laurel, Md.
Filed Jun. 26, 1981, Ser. No. 277,851
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30

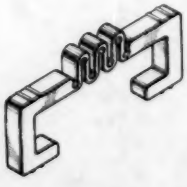
271,939
C-CLAMP
William D. Little, P.O. Box 20211, Dallas, Tex. 75220
Filed Jul. 24, 1981, Ser. No. 286,384
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—73



271,940
COMBINED SPACER AND FOLDABLE LOCK FOR WIRES OR THE LIKE
Rudolph E. Muench, Shelby, N.C., assignor to Fasco Controls Corporation, Shelby, N.C.
Filed Sep. 24, 1981, Ser. No. 305,273
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—356



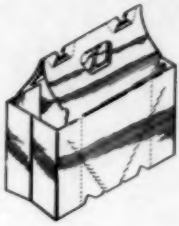
271,941
SKI CLIP
David E. Calapp, 4056 - 172nd Pl. SE., Bellevue, Wash. 98008
Filed Oct. 13, 1981, Ser. No. 310,514
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—395



271,942
CONTAINER FOR FOODSTUFFS
Neil V. H. Goldman, London, England, assignor to Frank Coleman (Luton) Limited, Flitwick, England
Filed Sep. 3, 1981, Ser. No. 299,239
Claims priority, application United Kingdom, Mar. 9, 1981, 81-999,308; Mar. 9, 1981, 81-999,309
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—414

271,943
COMBINED PACKAGING AND DISPLAY CONTAINER
Theodore W. Beise, Villa Park, and Howard J. Rasmussen, Fox River Grove, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.
Filed Dec. 15, 1980, Ser. No. 216,262
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—415

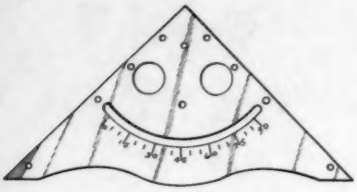
271,944
ARTICLE CARRIER
Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Aug. 28, 1981, Ser. No. 297,151
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—416



271,945
CLOSURE CAP OR THE LIKE
Charles S. Ochs, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Jul. 2, 1981, Ser. No. 279,768
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—452

271,946
WRISTWATCH
Toshiyuki Dobashi, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan
Filed Sep. 16, 1981, Ser. No. 302,728
Claims priority, application Japan, Mar. 17, 1981, 56-11073
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

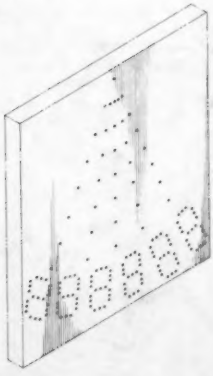
271,947
SHEAR GAGE
Paul J. Rakoczy, 28810 Village La., Farmington Hills, Mich. 48024
Filed Oct. 8, 1981, Ser. No. 309,554
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—62



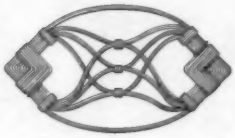
271,948
AMPERE-VOLT-WATTMETER OR THE LIKE
Takeo Kuramoto, Tokyo, Japan, assignor to Kyoritsu Electrical Instruments Works, Ltd., Tokyo, Japan
Filed May 1, 1981, Ser. No. 259,593
Claims priority, application Japan, Nov. 20, 1980, 55-48270
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—79

271,949
SMOKE DETECTOR
Louis J. DeChristopher, 69511 Iberia Ct., Rancho Mirage, Calif. 92270
Filed May 29, 1981, Ser. No. 268,581
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

271,950
ILLUMINATED DIGITAL READOUT SIMULATED PENDULUM DISPLAY FOR A TIMEPIECE
Merwyn E. Moore, P.O. Box 2061, Rapid City, S. Dak. 57709
Filed Feb. 24, 1981, Ser. No. 237,756
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—130

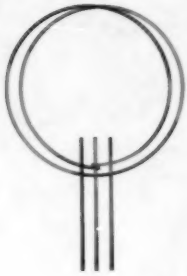


271,951
WIRE BRACELET
Lourinzo Lee, 839 W. 83rd, Chicago, Ill. 60620
Filed Oct. 18, 1979, Ser. No. 69,229
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—4



271,952
EARRING
Arthur A. Altman, 65-41 Wethrole St., Forest Hills, N.Y. 11374
Filed Mar. 12, 1982, Ser. No. 357,792
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—78

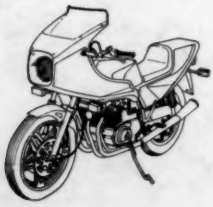
271,953
WIRE FORM FLOWER ARRANGEMENT FRAME DESIGN
Roderic M. Koch, Evansville, Ind., assignor to George Koch Sons, Inc., Evansville, Ind.
Filed Jun. 1, 1981, Ser. No. 268,698
Term of patent 14 years
Int. Cl. D11—*02*; D8—*99*
U.S. Cl. D11—143



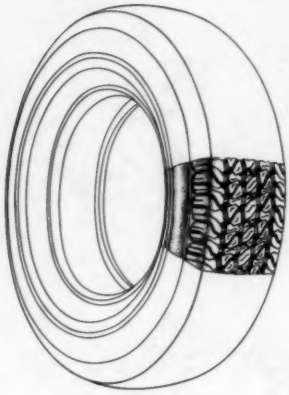
271,954
PLANTER
Andrew M. Neil, 3 Cancell Rd., London, England
Filed Aug. 3, 1981, Ser. No. 289,704
Claims priority, application United Kingdom, Feb. 10, 1981, 81998837
Term of patent 14 years
Int. Cl. D11—*02*; D6—*06*; D30—*03*
U.S. Cl. D11—156

271,955
PLANTER
Andrew M. Neil, 3 Cuacell Rd., London, England
Filed Aug. 3, 1981, Ser. No. 289,705
Claims priority, application United Kingdom, Feb. 10, 1981, 998838
Term of patent 14 years
Int. Cl. D11—*02*; D6—*06*; D30—*03*
U.S. Cl. D11—156

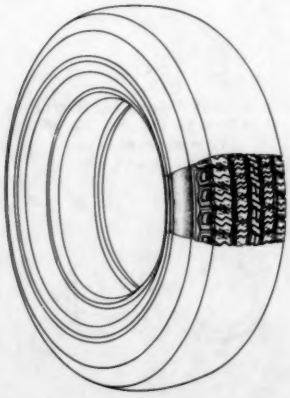
271,956
MOTORCYCLE
Minoru Morioka, Kawagoe; Mamoru Matsui, Tokyo, and Michihiko Yasuda, Fujimi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 16, 1980, Ser. No. 187,983
Claims priority, application Japan, Mar. 19, 1980, 55-10933
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110



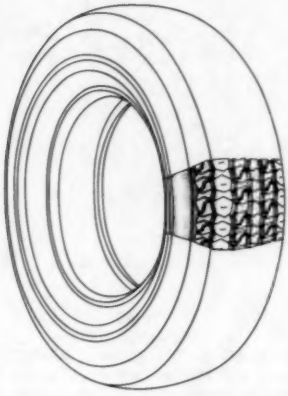
271,957
TIRE
Jean-Philippe Gorez, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jan. 5, 1982, Ser. No. 337,253
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



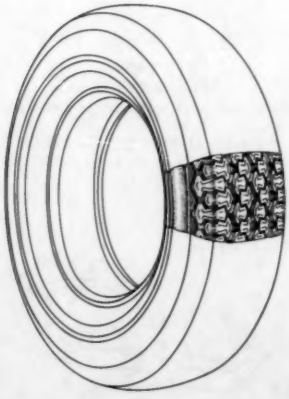
271,958
TIRE
Jean-Philippe Gorez, Greenville, S.C. assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jan. 5, 1982, Ser. No. 337,254
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



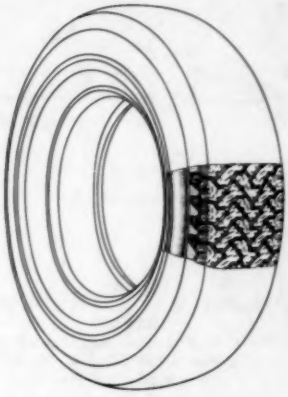
271,959
TIRE
Jean-Philippe Gorez, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jan. 5, 1982, Ser. No. 337,309
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



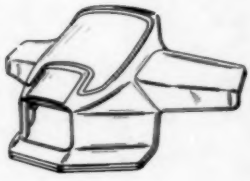
271,960
TIRE
Jean-Philippe Gorez, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jan. 5, 1982, Ser. No. 337,310
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



271,961
TIRE
Jean-Philippe Gorez, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jan. 5, 1982, Ser. No. 337,307
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—151

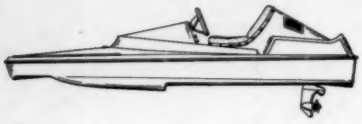


271,962
FRONT SHIELD FOR A MOTOR VEHICLE
Jun Ito, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 26, 1981, Ser. No. 277,507
Claims priority, application Japan, Dec. 26, 1980, 55-54961
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—182

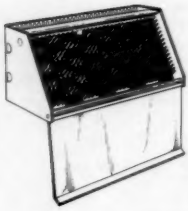


271,963
MULTIPLE-TUBED EXHAUST UNIT FOR AUTOMOTIVE VEHICLES
Frank E. Perkins, 2401 S. Grand Ave. East, Springfield, Ill. 62703
Filed Sep. 2, 1981, Ser. No. 298,913
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—194

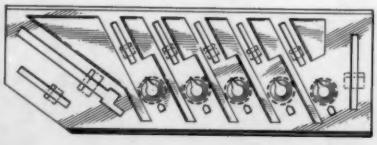
271,964
MOTOR BOAT
James E. Judd, Box 307, Lancaster, Mo. 63548
Filed Nov. 23, 1981, Ser. No. 323,969
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—307



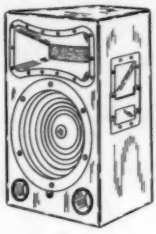
271,965
TELEPHONE TERMINAL BLOCK OR SIMILAR ARTICLE
Thomas A. Hollfelder, 6 Mulberry Rd., Huntington, N.Y. 11743
Filed Mar. 6, 1981, Ser. No. 241,029
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



271,966
CONTROL CONSOLE
William J. Brown, Naperville; Ramon C. Kohler, Montgomery, and John M. Parks, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Oct. 14, 1980, Ser. No. 196,895
Term of patent 14 years
Int. Cl. D13—*63*
U.S. Cl. D13—32

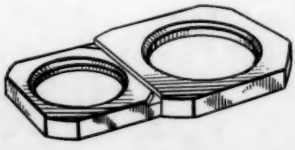


271,967
LOUDSPEAKER
John D. Meyer, 1531 Posen Ave., Albany, Calif. 94706, and Alexander Yuill-Thornton II, 208 Cardinal Rd., Mill Valley, Calif. 94941
Filed May 27, 1981, Ser. No. 267,640
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—34



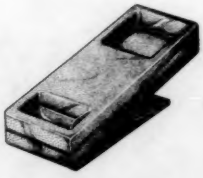
271,968
MEGAPHONE
Marc H. Segan, 154 W. 70th St., New York, N.Y. 10023; Seymour Cohen, 1554 Holiday Park Dr., Wantagh, N.Y. 11793, and Sayre Swarztrauber, 301 E. 79th St., New York, N.Y. 10021
Filed Jul. 1, 1981, Ser. No. 279,667
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—35

271,969
SPEAKER COVER
Jack R. Saidel, Flossmoor, Ill., assignor to Electronic Industries, Inc., Harvey, Ill.
Filed Jul. 21, 1980, Ser. No. 170,516
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—37

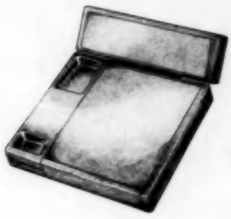


271,970
TELECOMMUNICATIONS INTERCONNECTION ENCLOSURE
Benne Velsher, Nepean, and Brian T. Osborne, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Aug. 21, 1981, Ser. No. 294,935
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—52

271,971
TELEPHONE STAND OR SIMILAR ARTICLE
Donald M. Genaro, Haworth; Carl W. Gomes, II, Ocean, both of N.J.; John N. McGarvey, Drexel Hill, Pa.; Gordon E. Sylvester, Jamaica, N.Y., and Joseph E. Tatarski, Point Pleasant, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Oct. 5, 1981, Ser. No. 308,505
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60

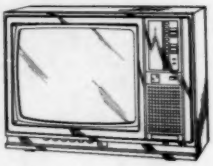


271,972
TELEPHONE STAND
Donald M. Genaro, Haworth; John Kowalik, Jr., Freehold, both of N.J.; John N. McGarvey, Drexel Hill, Pa.; Gordon E. Sylvester, Jamaica, N.Y., and Daniel W. Tyler, Middletown, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Oct. 5, 1981, Ser. No. 308,506
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60



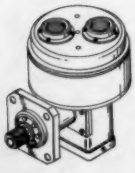
271,973
WALL TELEPHONE BASE HOUSING
George M. Janda, Wheaton, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.
Filed Oct. 1, 1981, Ser. No. 307,476
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—61

271,974
TELEVISION RECEIVER
Akira Takahashi, Tokyo; Noritaka Segawa, Koganei, and Takeichi Obata, Hino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 31, 1981, Ser. No. 297,570
Claims priority, application Japan, Mar. 18, 1981, 56-10876
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—80

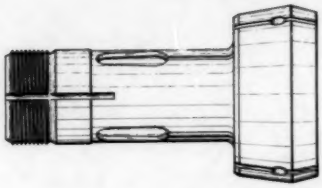


271,975
TERMINAL OUTPUT PRINTER
Robert E. Steinbugler, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 26, 1981, Ser. No. 267,110
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—111

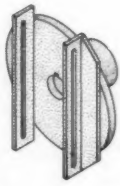
271,976
PISTON VACUUM PUMP
Forest G. Brown, Valley Center, Kans., assignor to Sigma Tek, Wichita, Kans.
Filed Dec. 31, 1981, Ser. No. 336,368
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7



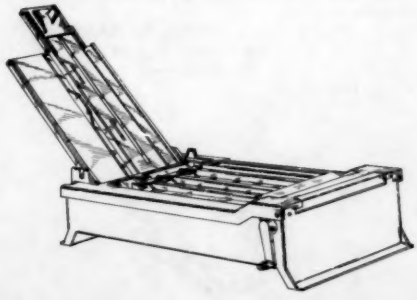
271,977
MASTER COLLET FOR MACHINE TOOLS
William R. Baker, Pine City, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.
Filed Sep. 15, 1981, Ser. No. 302,384
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—140



271,978
CRANK DISC FOR A HIGH REFUSE WET WASHING COAL JIG
Wilbur W. Bagby, Birmingham, Ala., assignor to Bagby Engineering Co., Birmingham, Ala.
Filed Sep. 22, 1980, Ser. No. 189,636
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—147

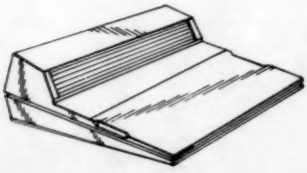


271,979
PROCESSOR FOR FILM PRINTS
Ralph M. Vigna, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed May 21, 1981, Ser. No. 265,753
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D16—33

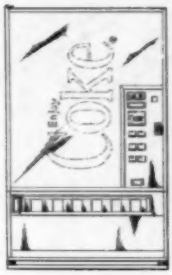


271,980
X-RAY DEVELOPING TANK
Roderique S. Gemmill, Davie, Fla., assignor to Radiation Concepts, Inc., Davie, Fla.
Filed Aug. 20, 1981, Ser. No. 294,535
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D16—35

271,981
NOTEPAPER PAD HOLDER
Walter C. Pearson, St. Paul, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.
Filed Aug. 3, 1981, Ser. No. 289,773
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—86

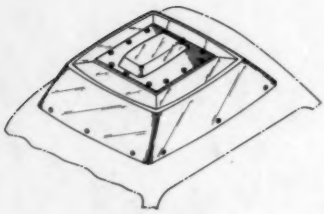


271,982
VENDING MACHINE
G. Merle Bachmann, Stone Mountain; Charles L. Davis, and Annis R. Morgan, Jr., both of Atlanta, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Division of Ser. No. 236,182, Feb. 20, 1981, Pat. No. Des. 266,337. This application Jul. 22, 1982, Ser. No. 400,854
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D20—5



271,983
VENDING MACHINE
G. Merle Bachmann, Stone Mountain; Charles L. Davis, and Annis R. Morgan, Jr., both of Atlanta, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Division of Ser. No. 236,181, Feb. 20, 1981, Pat. No. 267,498. This application Jul. 22, 1982, Ser. No. 400,863
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D20—5

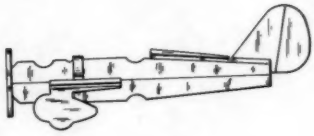
271,984
TAXICAB ADVERTISING SIGN
Jules Nelson, Philadelphia; Jimmie Walker, Audobon; Joseph J. Rossi, Philadelphia, and Samuel S. Leotta, Conshohocken, all of Pa., assignors to American Mobile Advertising Corp., Philadelphia, Pa.
Filed Aug. 31, 1981, Ser. No. 297,698
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—10



271,985
FOLD-OVER TWIN POCKET IDENTIFICATION BADGE HOLDER
Dana C. Belser, P.O. Box 2306, Rockville, Md. 20852
Filed Mar. 5, 1982, Ser. No. 355,046
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D20—27

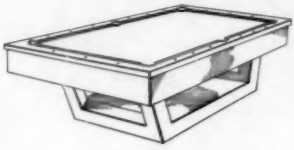
271,986
TWO POCKET IDENTIFICATION BADGE HOLDER
Dana C. Belser, P.O. Box 2306, Rockville, Md. 20852
Filed Mar. 5, 1982, Ser. No. 355,048
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D20—27

271,987
TOY AIRPLANE
Richard F. House, St. Charles, Ill., assignor to Container Corporation of America, Chicago, Ill.
Filed Dec. 14, 1981, Ser. No. 330,088
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—89

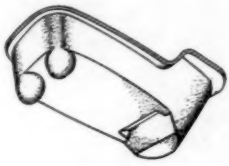


271,988
BEACH PAIL
Marc Rivollet, Oyonnax, France, assignor to Etablissements Fernand Berchet, France
Filed Jun. 8, 1981, Ser. No. 271,193
Claims priority, application France, Dec. 8, 1980, 803787
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—120

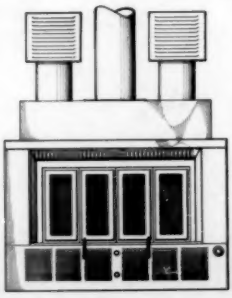
271,989
POOL TABLE
Antonin Painchaud, Longueuil, and Jean-Marc Painchaud, Ste-Julie, both of Canada, assignors to Beton Sports Canada Inc., St. Bruno, Canada
Filed Aug. 18, 1981, Ser. No. 293,860
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—232



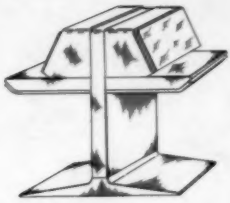
271,990
BABY BATH
John H. Lyne, Strathfieldsaye, Australia, assignor to Arthur W. Pulfer, Victoria, Australia
Filed Oct. 21, 1981, Ser. No. 313,497
Claims priority, application Australia, Sep. 17, 1981, 85-261
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—52



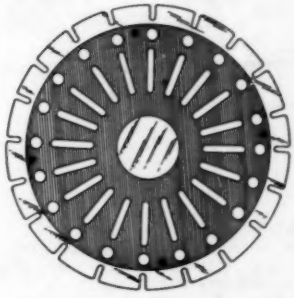
271,991
HIGH EFFICIENCY STOVE AND ZERO-CLEARANCE FIREPLACE INSERT
Albert B. Chamberlain, Stone Mountain, Ga., assignor to Atlanta Stove Works, Inc., Atlanta, Ga.
Filed May 15, 1981, Ser. No. 263,976
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—94

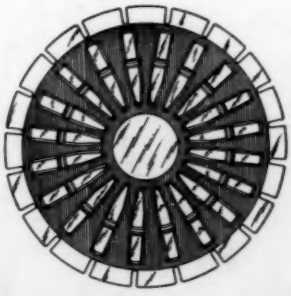


271,992
DENTAL TREATMENT CABINET
Carl W. Voltz, Lindenfels, Fed. Rep. of Germany, assignor to Sybron Corporation, Rochester, N.Y.
Filed May 13, 1981, Ser. No. 263,230
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—4

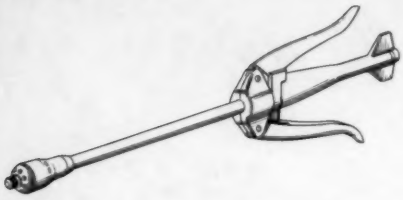


271,993
CUVETTE ARRAY
Peter J. Swartz, 33 Pine Ave., Randolph, Mass. 02368
Filed May 22, 1981, Ser. No. 266,371
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—17

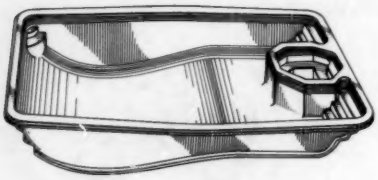




271,994
CIRCULAR ANASTOMOSIS SURGICAL STAPLER
Douglas G. Noiles, New Canaan; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Jun. 3, 1981, Ser. No. 270,276
Claims priority, application Canada, May 20, 1981, 20-05-81-1
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26



271,995
COMBINED HYDROTHERAPY SPA AND SWIMMING POOL
Lino Z. Topete, 1845 E. San Antonio St., San Jose, Calif. 95116
Filed Aug. 18, 1980, Ser. No. 179,116
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02;* D25—*99*
U.S. Cl. D24—38



271,996
COMPACT FLUORESCENT LAMP
Masumi Nanba, Funabashi; Yoshio Kojima, Yokohama, and Nobuhiro Umehara, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Dec. 23, 1981, Ser. No. 333,657
Claims priority, application Japan, Jun. 24, 1981, 56-27286
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D26—3

271,997
COMPACT FLUORESCENT LAMP
Taketo Kamei; Kimio Osada, both of Yokosuka; Masumi Nanba, Funabashi; Nobuhiro Umehara, Tokyo, and Yoshio Kojima, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Dec. 23, 1981, Ser. No. 333,658
Claims priority, application Japan, Sep. 21, 1981, 56-41485
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D26—3

271,998
COMPACT FLUORESCENT LAMP
Masumi Nanba, Funabashi; Yoshio Kojima, Yokohama, and Nobuhiro Umehara, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Dec. 23, 1981, Ser. No. 333,659
Claims priority, application Japan, Jun. 24, 1981, 56-27289
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D26—3

271,999
COMPACT FLUORESCENT LAMP
Masumi Nanba, Funabashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Dec. 23, 1981, Ser. No. 333,890
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D26—3

272,000
COMPACT FLUORESCENT LAMP
Masumi Nanba, Funabashi; Yoshio Kojima, Yokohama, and Nobuhiro Umehara, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Dec. 23, 1981, Ser. No. 333,894
Claims priority, application Japan, Jun. 24, 1981, 56-27285
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D26—3

272,001
COMPACT FLUORESCENT LAMP
Masumi Nanba, Funabashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Dec. 23, 1981, Ser. No. 333,904
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D26—3

272,002
COMPACT FLUORESCENT LAMP
Nobuhiro Umehara, Tokyo; Yoshio Kojima, Yokohama, and Masumi Nanba, Funabashi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Dec. 23, 1981, Ser. No. 333,906
Claims priority, application Japan, Jul. 23, 1981, 56-32307
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D26—3

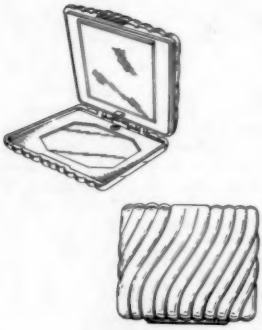
272,003
LIGHTING FIXTURE
Michael T. Jankowski, Stiphout, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 17, 1981, Ser. No. 293,809
Claims priority, application Benelux, Mar. 17, 1981, 55570-02
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—63

272,004
LAMP BASE
William E. Martin, P.O. Box 5521, Abilene, Tex. 79604, and Lyana J. Lance, 2025 Lowden, Abilene, Tex. 79603
Filed Apr. 3, 1981, Ser. No. 250,542
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—94

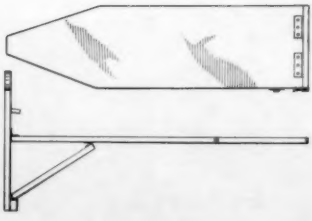
272,005
LIGHTER
Franz A. Stützer, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany
Filed Oct. 5, 1981, Ser. No. 308,685
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 5MR-10328
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

272,006
PERFUME DISPENSER PACKAGE
Reinold Geiger, Neuilly, France, assignor to AMS Ateliers de Moulage Specialise, France
Filed Feb. 4, 1981, Ser. No. 231,033
Claims priority, application France, Aug. 6, 1980, 802,572
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—5

272,007
VANITY MIRROR
Kwok K. Cheung, Kwai Chung, Hong Kong, assignor to Wing Kiu Tong and King Sing Tong, both of Kwai Chung, Hong Kong, a part interest
Filed Nov. 10, 1981, Ser. No. 320,119
Claims priority, application United Kingdom, Jul. 14, 1981, 1 001 453
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—83



272,008
WALL MOUNTED FOLDING IRONING BOARD
Walker L. Flory, 1108 Darby St., Orange, Calif. 92665
Filed Aug. 21, 1980, Ser. No. 180,017
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—66



# LIST OF PATENTEES

## TO WHOM

## PATENTS WERE ISSUED ON THE 27TH DAY OF DECEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-Lok Products, Inc.: *See—*
Ditcher, Jack, 4,422,994, Cl. 264-219.000.

Aaron, Jon D.: *See—*
Habdas, Edward P.; Aaron, Jon D.; and Whitten, Timothy H., 4,422,233, Cl. 29-570.000.

Abbott, Barry J.; and Silcox, William H., to Chevron Research Company. Sliding tension leg tower. 4,422,806, Cl. 405-227.000.

Abbott Laboratories: *See—*
McAlpine, James B.; and Carney, Ronald E., 4,423,210, Cl. 536-16.100.

Abbott-Northwestern Hospital, Inc.: *See—*
Burton, Charles V., 4,422,452, Cl. 128-75.000.

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Abe, Ryozo: *See—*
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,423,497, Cl. 369-47.000.

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ACF Industries, Incorporated: *See—*
Cordani, Eugene J.; Hammonds, James C.; and Vorwerk, Frederick E., 4,422,532, Cl. 188-47.000.
Polley, Richard B., 4,422,473, Cl. 137-625.320.

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Maret, Jean C., 4,422,486, Cl. 144-117.00R.

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Ackley, William R.: *See—*
Messick, John R.; Ackley, William R.; and Moon, George D., Jr., 4,422,903, Cl. 203-19.000.

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Adeka Argus Chemical Co., Ltd.: *See—*
Minagawa, Motonobu; Kubota, Naohiro; and Kimura, Ryoji, 4,423,174, Cl. 524-99.000.

Aderans Co., Ltd.: *See—*
Nemoto, Nobuo, 4,422,230, Cl. 29-434.000.

Adkins, David E.: *See—*
Wittman, Robert H.; Adkins, David E.; and Haws, Ronnie E., 4,422,477, Cl. 138-89.000.

AECI Limited: *See—*
Norton, John H. R., 4,422,412, Cl. 123-3.000.

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Ishogai, Nobuo; Motoyuki, Hosokawa; Takashi, Okawa; Wakui, Natsuko; and Watanabe, Toshiyasu, 4,423,258, Cl. 568-902.000.
Kikuchi, Keisuke; Morikawa, Takitaro; Shimada, Junichi; and Sakurai, Kenjiro, 4,422,733, Cl. 350-413.000.
Nakano, Eiji, 4,423,406, Cl. 338-32.00R.

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Posch, Gerhard; and Nefzger, Rolf, 4,422,840, Cl. 425-472.000.

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Thurm, Siegfried; and Bunge, Konrad, 4,422,752, Cl. 355-41.000.

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Janssens, Wilhelmus, 4,423,142, Cl. 430-504.000.

Ahmed, Munir A.: *See—*
Hayes, Harry; and Ahmed, Munir A., 4,423,030, Cl. 424-58.000.

Aihara, Kenichi: *See—*
Araki, Kazuhiko; Ao, Hideki; Aihara, Kenichi; and Kimura, Tomohiko, 4,423,052, Cl. 424-266.000.

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Nishikawa, Masumi, 4,422,346, Cl. 74-493.000.
Yamamoto, Junji; Kanou, Noboru; and Usami, Masayuki, 4,422,689, Cl. 296-224.000.

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Matsumoto, Gohichi; and Hayakawa, Yohichi, 4,422,349, Cl. 74-665.0GE.

Aisslinger, Dieter: *See—*
Pusch, Gunter; Aisslinger, Dieter; and Hoffmann, Alexander, 4,423,104, Cl. 428-101.000.

Aizawa, Shoji: *See—*
Saito, Eiji; Aizawa, Shoji; Mitsui, Michio; Miyata, Tomohiko; and Kuroda, Masayuki, 4,422,576, Cl. 239-693.000.

Ajinomoto Company Incorporated: *See—*
Kitamura, Nobuyoshi; Ito, Nobuo; and Takeuchi, Koji, 4,423,175, Cl. 524-100.000.
Yasuda, Naohiko; Iwagami, Hisao; Irie, Yasuo; Nakanishi, Eiji; and Saito, Hideomi, 4,423,215, Cl. 544-025.000.

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Peschel, Karl, 4,423,499, Cl. 369-55.000.

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Tanaka, Hiroaki; and Akita, Shigeyuki, 4,423,417, Cl. 340-870.370.

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Nilsson, Mats, 4,423,345, Cl. 310-153.000.

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Ogata, Yoshiro; Yamazaki, Haruo; and Akutsu, Hidezoh, 4,423,350, Cl. 313-493.000.
Ogata, Yoshiro; Yamazaki, Haruo; Ikeda, Takashi; and Akutsu, Hidezoh, 4,423,353, Cl. 313-631.000.

Akzona, Inc.: *See—*
Poppel, Guenter; Schuermann, Horst; and Falkenberg, Gabriel, 4,422,879, Cl. 106-238.000.

Alaspa, Allan A.; and Beutler, Robert R., to Motorola, Inc. Integrated voltage supply. 4,423,369, Cl. 323-303.000.

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Thomas, Alvin D., 4,422,595, Cl. 242-116.000.

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Batz, Hans-Georg; Albert, Winfried; Lenz, Helmut; Linke, Hans-Ralf; and Stahler, Fritz, 4,423,227, Cl. 548-406.000.

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Cannata, Vincenzo; and Tamerlani, Giancarlo, 4,423,244, Cl. 562-466.000.

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Alfonsi, Dante; and Alfonsi, Stefan. Hot runner system in plastics molding tools. 4,422,841, Cl. 425-548.000.

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Alfonsi, Dante; and Alfonsi, Stefan, 4,422,841, Cl. 425-548.000.

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Cheesman, Barbara E.; and Alikhan, Raza, 4,422,548, Cl. 206-370.000.

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Allen, Robert J.: *See—*
Juda, Walter; Allen, Robert J.; Lindstrom, Robert; and Bar-Ilan, Amiran, 4,422,911, Cl. 204-106.000.

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Birkmaier, Albert A.; Harpell, Gary A.; Kurtz, Bruce E.; Patel, Gordhanbhai N.; Poncha, Rustom P.; Skovrinski, Adam L.; and Lesco, James M., 4,422,907, Cl. 204-38.00B.
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Tamura, Ryutaro; and Endo, Yasushi, 4,423,464, Cl. 361-288.000.

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Kasai, Shigeo, 4,422,628, Cl. 269-71.000.

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Kato, Hiroshi; and Numata, Masanori, 4,423,314, Cl. 235-377.000.
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Amano, Kitsutaro: *See—*
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Amazonen Werke AG H. Dreyer: *See—*
Dreyer, Heinz; and Wiemeyer, Benno, 4,422,392, Cl. 111-52.000.

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Kaucic, Robert A., 4,422,526, Cl. 182-36.000.

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Brown, Dale G., 4,423,062, Cl. 424-275.000.
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Galvin, Aaron A.; and Harvey, Roy L., 4,423,410, Cl. 340-525.000.

American Fletcher National Bank and Trust Company, Administrator: *See—*
Clinton, Albert J., deceased; and O'Doherty, George O. P., 4,423,065, Cl. 424-304.000.

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Demerson, Christopher A.; Humber, Leslie G.; and Ferland, Jean-Marie, 4,423,232, Cl. 548-472.000.
Zabel, Herbert E.; and Lelyk, William, 4,422,311, Cl. 70-25.000.

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Costello, William D.; Helton, Charles J., III; and Frank, Martin B., 4,422,660, Cl. 280-242.0WC.

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Dusza, Robert J., 4,422,861, Cl. 55-498.000.

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Kaltz, Milton C.; Chojnowski, Edward M.; Garascia, David C.; Bauer, Barney J.; and George, Richard D., 4,422,687, Cl. 296-221.000.

Amikura, Takashi: *See—*
Masunaga, Makoto; Kinoshita, Takao; Sakane, Toshio; Tsunekawa, Tokuichi; Hosoe, Kazuya; Amikura, Takashi; and Harigaya, Isao, 4,422,741, Cl. 354-403.000.

Amon, William F., Jr.; Geigert, John; and Neidleman, Saul L., to Cetus Corporation. Process for the production of D-glucosone. 4,423,149, Cl. 435-105.000.

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Croci, Dana; and Kaplon, David A., 4,422,709, Cl. 339-176.0MF.
Wolowicz, James P., 4,422,711, Cl. 339-252.00R.

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Svendsen, Gordon D., 4,423,383, Cl. 328-63.000.

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Chen, Andy C. C.; Rizzuto, Anthony B.; and Veiga, Martin F., 4,423,085, Cl. 426-632.000.

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Pomonik, George M., 4,422,401, Cl. 114-294.000.

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Hogg, James W., 4,422,608, Cl. 248-205.00A.

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Fox, Richard E., 4,423,116, Cl. 428-411.000.

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Ash, Mary L.; and Pews, Richard G., to Dow Chemical Company, The. Pyridinyl fungicides and herbicides. 4,423,222, Cl. 546-337.000.
Aspinwall, Ronald A., to Vickers, Incorporated. Variable gain servo controlled directional valve. 4,422,475, Cl. 137-630.150.
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Collins, Kenneth L., 4,422,505, Cl. 166-256.000.
DiGiulio, Adolph V., 4,423,160, Cl. 521-59.000.
Perkins, Thomas K., 4,422,830, Cl. 417-54.000.
Atwater, William M. Textile spindle cleaning apparatus. 4,422,200, Cl. 15-21.00D.
Aviation Electric Ltd.: *See*—
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Babberl, Marion G., to Rapid Mounting & Finishing Company. Multiple segmented display device. 4,422,253, Cl. 40-453.000.
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Hutchings, Thomas J.; and Babcock, Gary D., 4,422,762, Cl. 356-350.000.
Babcock & Wilcox Company, The: *See*—
Houk, LeRoy E., 4,422,783, Cl. 400-128.000.
Nelson, John E.; Hammond, Charles W.; Huston, Rolland E.; and Helton, Michael R., 4,422,882, Cl. 134-22.180.
Babiol, Pierre, to Societe Nouvelle de Bouchons Plastiques. Nestable pouring spout assemblies. 4,422,563, Cl. 222-153.000.
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Baeger, Holm; and Wedel, Hans, to VDO Adolf Schindling AG. Lacquer, with inorganic filler, coating display-element's polarizer. 4,422,727, Cl. 350-334.000.
Baetje, Kenneth J., to Midwest Cut Stone Co. Anchor pocket system for cut stone trim and the like. 4,422,275, Cl. 52-509.000.
Baglin, Elizabeth G.; and Gomes, John M., to United States of America, Interior. Selective recovery of base metals and precious metals from ores. 4,423,011, Cl. 423-22.000.
Bagner, Carl; and Wildman, Arthur S., to Merck & Co., Inc. Process for the whole broth extraction of avermectin. 4,423,211, Cl. 536-16.900.
Bailey, David F.; Gilmore, Merle L.; Ganucheau, Charles J., Jr.; and Clow, Gary W., to Motorola, Inc. Decoder for transmitted message deactivation code. 4,423,416, Cl. 340-825.520.
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Blackford, John E.; Kelly, John J.; and Baker, Philip A., 4,422,673, Cl. 285-23.000.
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Balogh, Tibor: *See*—
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Gurol, I. Macit; and Bang, Gary M., 4,423,299, Cl. 210-159.00B.
Bar, Alfredo, to NECCHI Societa per Azioni. Starting relay of the PTC resistor type in motocompressors for refrigerators. 4,423,405, Cl. 338-25.000.
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Juda, Walter; Allen, Robert J.; Lindstrom, Robert; and Bar-Ilan, Amiran, 4,422,911, Cl. 204-106.000.
Bar, Rami. Polymeric films for use in agriculture. 4,423,164, Cl. 523-135.000.
Baranczuk, Richard J., to Brune, Peter S., a part interest. Process for preparation of costrol for use in estrogen receptor tests. 4,423,151, Cl. 436-8.000.
Bardo, Charles J.; and Green, Andrew, to Ceramic Cooling Tower Company. Fiberglass reinforced cooling tower. 4,422,983, Cl. 261-24.000.
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Barrette, Richard P. Packaging fastener. 4,422,217, Cl. 24-16.00R.
Barsa, Edward A.; and Onder, Kemal, to Upjohn Company, The. Amorphous copolyamide from lactam, dicarboxylic acid and bisimidazoline. 4,423,204, Cl. 528-323.000.
Bartl, Richard, to Westfalische Metall Industrie KG Hueck & Co. Multi-chamber lamp for vehicles. 4,423,475, Cl. 362-249.000.
Bartman, Benjamin, to Rohm and Haas Company. Pressure sensitive hot melt adhesives. 4,423,182, Cl. 524-367.000.
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Baschang, Gerhard; Hartmann, Albert; Wacker, Oskar; and Tarcsay, Lajos, to Ciba-Geigy Corporation. Phosphoryl compounds, pharmaceutical preparations containing such compounds, and their use. 4,423,038, Cl. 424-177.000.
BASF Aktiengesellschaft: *See*—
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Felleisen, Peter; Mayer, Dieter; Koester, Eberhard; Domas, Friedrich; and Deigner, Paul, 4,423,454, Cl. 360-135.000.
Hoelderich, Wolfgang; Mross, Wolf D.; and Schwarzmann, Matthias, 4,423,273, Cl. 585-640.000.
Merger, Franz; and Schroff, Ludwig, deceased, 4,423,247, Cl. 564-391.000.
Roos, Hans; Boehn, Hugo; Bittler, Knut; and Schlaefer, Dieter, 4,422,921, Cl. 204-290.00R.
Schirmer, Ulrich; Rohr, Wolfgang; and Wuerzer, Bruno, 4,422,871, Cl. 71-120.000.
BASF Wyandotte Corporation: *See*—
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Basrai, Habil S.; and Rajagopal, Ganesh, to Ford Motor Company. Electro-hydraulic remote valve. 4,422,474, Cl. 137-625.640.
Bass, Charles E.: *See*—
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Bass, Harold E.; Bass, James L.; Bass, Richard E.; Bass, Peter J.; and Bass, Charles E. Plasma welding torch. 4,423,304, Cl. 219-121.0PM.
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Basu, Samar, to Bell Telephone Laboratories, Incorporated. Ambient temperature rechargeable battery. 4,423,125, Cl. 429-194.000.
Bataille, Jean R.; and Charollais Bataille, Nicole J. J. System for keeping the foot and the leg in position. 4,422,248, Cl. 36-121.000.
Batistoni, Michel, to Framatome. Making of steam generator water boxes. 4,422,499, Cl. 165-71.000.
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Batz, Hans-Georg; Albert, Winfried; Lenz, Helmut; Linke, Hans-Ralf; and Stahler, Fritz, to Boehringer Mannheim GmbH. Process for the preparation of reactive, couplable derivatives of the thyroid hormones. 4,423,227, Cl. 548-406.000.

Bauer, Barney J.: *See*—
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Bauer, Wayne J.; Dodt, William C.; Kirkpatrick, Charles R.; Rehage, Ted A.; Robinson, Francis L.; and Taylor, William K., to International Business Machines Corporation. Buffered peripheral system with priority queue and preparation for signal transfer in overlapped operations. 4,423,480, Cl. 364-200.000.

Bauernfeind, John; Carnahan, Russell W.; Lodal, Norman; and Vazquez, Domingo, to Kraft, Inc. Method for manufacturing quick cooking pasta products. 4,423,082, Cl. 426-557.000.

Baumgartner, Friedrich; Romar, Alfred; and Rigles, Albert, to Veitscher Magnesitwerke-Actien-Gesellschaft. Apparatus for repairing a refractory furnace lining. 4,422,626, Cl. 266-281.000.

Baumgartner, Rolf, to Rolf Baumgartner AG. Mixing apparatus. 4,422,772, Cl. 366-287.000.

Baxter, Kenneth D.: *See*—
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Baxter Travenol Laboratories, Inc.: *See*—
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Bayer Aktiengesellschaft: *See*—
Arlt, Klaus-Peter; Binsack, Rudolf; Grigo, Ulrich; and Neuray, Dieter, 4,423,196, Cl. 526-72.000.
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Grigo, Ulrich; Fahnler, Friedrich; and Binsack, Rudolf, 4,423,186, Cl. 525-66.000.
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Krock, Friedrich W.; and Neeff, Rutger, 4,422,973, Cl. 260-382.000.
Lantzsch, Reinhard; Ditgens, Klaus; Heinemann, Ulrich; Thomas, Rudolf; and Weber, Erhard, 4,423,225, Cl. 548-373.000.
Lobach, Wilfried; Haas, Peter; Kolb, Gunter; Sackmann, Guter; and Probst, Joachim, 4,423,194, Cl. 525-327.600.
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,423,058, Cl. 424-273.00P.
Riebel, Hans-Jochem; Eue, Ludwig; and Faust, Wilfried, 4,422,866, Cl. 71-92.000.

Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-4-nitrodiphenyl ethers. 4,422,868, Cl. 71-98.000.

Bayly Engineering Limited: *See*—
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Beale, Harry A.: *See*—
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Beatty, Charles L.: *See*—
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Beck, Harold K., to Halliburton Company. Low pressure responsive APR tester valve. 4,422,506, Cl. 166-324.000.

Beck, Jean L.; Le Bars, Jean F.; Emmanuelli, Yves A.; and Bargues, Denis, to Thomson-CSF. Optoelectronic device for videofrequency scanning of images. 4,423,437, Cl. 358-113.000.

Becker, Dustin J., to Reliance Electric Company. Circuit for generating two periodic signals having a controllable phase relationship therebetween. 4,423,382, Cl. 328-55.000.

Becker, Edward W.; Harville, Paul R.; and MacLeod, Glen E., to Bell Telephone Laboratories, Incorporated. Tool for joining connectors. 4,422,235, Cl. 29-749.000.

Becker, Erwin-Willy; Ehrfeld, Wolfgang; Krieg, Gunther; and Bier, Wilhelm, to Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung. Method for producing separating nozzle elements used for separating gaseous or vaporous mixtures. 4,422,905, Cl. 204-9.000.

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Becton Dickinson and Company: *See*—
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Beebe, James C., to Eagle-Picher Industries, Inc. Instrumentation resonance compensation. 4,422,336, Cl. 73-769.000.

Beecham Group Limited: *See*—
Taskis, Charles B., 4,423,033, Cl. 424-80.000.

Beecken, Hermann, to Bayer Aktiengesellschaft. Cationic styryl dyestuffs. 4,422,969, Cl. 260-152.000.

Behn, Reinhard; and Kaufman, Kurt, to Siemens Aktiengesellschaft. Apparatus for manufacturing metal layers and glow polymer layers which are superimposed and arranged laterally offset relative to one another. 4,422,406, Cl. 118-719.000.

Behr, Fred E., to Minnesota Mining and Manufacturing Company. Cyclic perfluoroaliphatic-disulfonic acid anhydrides and sulfonamide derivatives thereof. 4,423,197, Cl. 526-220.000.

Behrenz, Wolfgang: *See*—
Fuchs, Rainer; Naumann, Klaus; Behrenz, Wolfgang; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,423,066, Cl. 424-305.000.

Bell Telephone Laboratories, Incorporated: *See*—
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El Hamamsy, Mahoud A., 4,423,330, Cl. 250-551.000.
MacChesney, John B.; O'Connor, Paul B.; and Sullivan, Miles V., 4,422,898, Cl. 156-655.000.
Turek, Gregory J., 4,423,292, Cl. 179-18.0FA.

Bell, Weldon K.; and Chang, Clarence D., to Mobil Oil Corporation. Dimethyl ether synthesis catalyst. 4,423,155, Cl. 502-38.000.

Bellus, Daniel: *See*—
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,423,231, Cl. 548-451.000.

Belson, William W.: *See*—
Statz, Robert G.; and Belson, William W., 4,422,434, Cl. 126-438.000.

Bender Machine Works, Inc.: *See*—
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Bendix Corporation, The: *See*—
Ewald, Jerome T., 4,422,293, Cl. 60-547.100.
Hansen, Charles M., Jr., 4,423,374, Cl. 324-86.000.
Luscomb, Douglas A., 4,422,424, Cl. 123-447.000.
Ohnesorge, David H.; and Antonazzi, Frank J., 4,422,335, Cl. 73-724.000.

Benneche, Tore; Gacek, Mikkel J.; and Undheim, Kjell, to Nyegaard & Co. A/S. Pyrimidine-2-sulphides and their S-oxides for use in medicine and methods of use therefor, pharmaceutical compositions containing them, processes for their preparation and per se novel sulphides and S-oxides. 4,423,047, Cl. 424-251.000.

Bennett, Clarence L., Jr.; and Price, Robert, to Sperry Corporation. Apparatus and method for detecting the onset of a frequency shift keyed signal. 4,423,519, Cl. 375-80.000.

Benoit, Pierre; Pellaux, Jean-Paul; Widmer, Gilbert; Kerllenevich, Betty; and Coche, Andre, to Cables Cortaillod S.A. Ellipsoidal optical coupling device. 4,422,714, Cl. 350-96.150.

Berezowski, Jaroslaw; and Feinman, Harvey M., to Sealectro Corporation. Micro card reader. 4,423,317, Cl. 235-458.000.

Bergeron, Gary A., to Talos Systems, Inc. Apparatus and method for determining the position of a driven coil within a grid of spaced conductors. 4,423,286, Cl. 178-19.000.

Berginski, Werner-Ernst, to Leopold Kostal GmbH & Co. KG. Steering column switch with flasher switch. 4,423,297, Cl. 200-61.540.

Bergsand, Arne; and Marsland, Henryk, to Goteborgs Maskinkonsult Aktiebolag. Installation for internal cleaning of tubes. 4,422,210, Cl. 15-302.000.

Bergvall, Bengt A., to Husqvarna Aktiebolag. Sewing guide of a seam pattern sewing machine. 4,422,394, Cl. 112-158.00F.

Berisch, Volker: *See*—
Schopper, Bernd; and Berisch, Volker, 4,422,694, Cl. 303-84.00A.

Bernard Strutt Agencies Limited: *See*—
Mattingly, Denis A. E., 4,422,935, Cl. 210-223.000.

Bernardoni, Luigi, to Alfa Romeo S.p.A. Intake duct fitted with non-return valve means. 4,422,416, Cl. 123-52.0MF.

Berner, George J., to Hobart Corporation. Commodity display for weighing scale. 4,423,486, Cl. 364-466.000.

Berning, Peter H.: *See*—
Hahn, Robert E.; Jones, Thomas R.; and Berning, Peter H., 4,422,721, Cl. 350-164.000.

Berntell, John O., to Mechanical Technology Incorporated. Hot gas engine heater head. 4,422,291, Cl. 60-517.000.

Berrange, Aubrey R. Compactor. 4,422,795, Cl. 404-124.000.

Berry, Richard C.: *See*—
Greenman, Norman L.; Berry, Richard C.; Tracy, Douglas H.; Arnio, Bruce M.; Lunt, Michael S.; and Otto, Jeffrey B., 4,423,109, Cl. 428-288.000.

Berthold, Heinz, to Brueninghaus Hydraulik GmbH. Axial piston machine having inclined axis construction with swivel carriage and adjusting arrangement. 4,422,367, Cl. 91-484.000.

Bertolacini, Ralph J.; Hirschberg, Eugene H.; and Modica, Frank S., to Standard Oil Company (Indiana). Process for removing sulfur oxides from a gas. 4,423,019, Cl. 423-244.000.

Bessot, Jean-Jacques; and Bourdon, Bernard, to Compagnie Industrille des Telecommunications Cit-Alcatel. Apparatus for chemically activated deposition in a plasma. 4,422,407, Cl. 118-723.000.

Beun, Roger, to Northern Telecom Limited. Supports for telephone jacks and circuit boards incorporating such supports. 4,423,466, Cl. 361-400.000.

Beutler, Robert R.: *See*—
Alaspa, Allan A.; and Beutler, Robert R., 4,423,369, Cl. 323-303.000.

BFG Glassgroup: *See*—
Mertin, Dietrich; Derner, Paul; and von Reis, Wolf, 4,422,280, Cl. 52-788.000.

Bichet, Lucien, to Anver. Machines for bending footwear counters. 4,422,198, Cl. 12-54.300.

Bier, Wilhelm: *See—*
Becker, Erwin-Willy; Ehrfeld, Wolfgang; Krieg, Gunther; and Bier, Wilhelm, 4,422,905, Cl. 204-9.000.

Bini, Marco; Ignesti, Amleto; Millanta, Luigi; Rubino, Nicola; and Vanni, Riccardo, to Consiglio Nazionale Delle Ricerche. Instrument for monitoring the radiation hazard arising from electric and/or magnetic radio-frequency fields. 4,423,372, Cl. 324-72.000.

Binsack, Rudolf: *See—*
Arlt, Klaus-Peter; Binsack, Rudolf; Grigo, Ulrich; and Neuray, Dieter, 4,423,196, Cl. 526-72.000.
Grigo, Ulrich; Fahnler, Friedrich; and Binsack, Rudolf, 4,423,186, Cl. 525-66.000.

Bird, David O.: *See—*
Gusack, James A.; Bird, David O.; Thomm, Ernest C.; and Reitz, William A., 4,422,224, Cl. 28-272.000.

Birkmaier, Albert A.; Harpell, Gary A.; Kurtz, Bruce E.; Patel, Gordhanbhai N.; Poncha, Rustom P.; Skovrinski, Adam L.; and Lesco, James M., to Allied Corporation. Pretreatment of plastic materials for metal plating. 4,422,907, Cl. 204-38.00B.

Birkner, Rainer: *See—*
Goerner, Klaus; Dietze, Manfred; and Birkner, Rainer, 4,422,566, Cl. 226-191.000.

Birnholz, Jean, to Ultra-precision, S.A. Support device for integrated circuit. 4,422,708, Cl. 339-176.0MP.

Bitting, Ricky F.; and Marion, Roland M., to General Electric Company. Tape recorder utilizing an integrated circuit. 4,423,442, Cl. 360-68.000.

Bittler, Knut: *See—*
Roos, Hans; Boehn, Hugo; Bittler, Knut; and Schlaefer, Dieter, 4,422,921, Cl. 204-290.00R.

Black Clawson Company, The: *See—*
Nowisch, Heinz E., 4,422,588, Cl. 242-56.300.
Tetro, Richard S., 4,422,586, Cl. 242-56.00R.

Black & Decker Inc.: *See—*
Braithwaite, John D.; King, Derrick O.; and Williams, Sidney J., 4,422,788, Cl. 401-188.00R.

Black, Robert S.: *See—*
Williams, Carl L., Jr.; Black, Robert S.; and Payne, Larry R., 4,422,723, Cl. 350-295.000.

Blackford, John E.; Kelly, John J.; and Baker, Philip A., to Lucas Industries Limited. Pipe couplings. 4,422,673, Cl. 285-23.000.

Blanchard, Alan, to United Kingdom Atomic Energy Authority. Fluidic control devices. 4,422,476, Cl. 137-810.000.

Blaschke, Felix; and Reng, Leonhard, to Siemens AG. Device for determining the parameter values for stator resistance, principal inductance and leakage inductance of an asynchronous machine. 4,423,367, Cl. 318-803.000.

Bledsoe, Billy M. Insulating shade device. 4,422,492, Cl. 160-84.00R.

Blenkinsop, Paul A.: *See—*
Neal, Donald F.; and Blenkinsop, Paul A., 4,422,887, Cl. 148-133.000.

Blizzard, John D., to Dow Corning Corporation. Silicone-organic coating compositions. 4,423,095, Cl. 427-387.000.

Board of Regents, The University of Texas System: *See—*
Ranney, David F.; and Quattrone, Alfred J., 4,423,153, Cl. 436-63.000.

Boehn, Hugo: *See—*
Roos, Hans; Boehn, Hugo; Bittler, Knut; and Schlaefer, Dieter, 4,422,921, Cl. 204-290.00R.

Boehringer Mannheim GmbH: *See—*
Batz, Hans-Georg; Albert, Winfried; Lenz, Helmut; Linke, Hans-Ralf; and Stahler, Fritz, 4,423,227, Cl. 548-406.000.

Boeing Company, The: *See—*
Franklin, James L.; Shannon, Roger L.; and Watkins, Dale F., 4,422,501, Cl. 165-104.260.
Pinson, George T., 4,422,427, Cl. 123-478.000.

Boffelli, Pier C., to Baruffaldi Frizioni S.p.A. Apparatus for rotating in either direction a turret that carries plural tool holders. 4,422,352, Cl. 74-813.00L.

Bofors Nobel, Incorporated: *See—*
Cousino, James L.; Nalewick, James A.; and Hills, Blair H., 4,422,940, Cl. 210-631.000.

Bogdany, John, to General Tire & Rubber Company, The. Patternized coating. 4,423,103, Cl. 428-95.000.

Bohner, Beat; Rempfler, Hermann; and Schurter, Rolf, to Ciba-Geigy Corporation. Herbicidally active unsaturated esters of halogenated α-[4-(pyridyl-2'-oxy)-phenoxy]-propionic acids. 4,422,867, Cl. 71-094.000.

Bollenbeck, Peter H.: *See—*
Flock, John W.; Matson, Stephen L.; and Bollenbeck, Peter H., 4,423,207, Cl. 528-499.000.

Bombaridier-Rotax Gesellschaft m.b.H.: *See—*
Obermayer, Alfred, 4,422,417, Cl. 123-185.0BA.

Bonfilio, Paul F.; and Stobe, Richard. Modular chassis and body for motor vehicles. 4,422,685, Cl. 296-197.000.

Bonin, John H.; Meyer, John W.; and Daniel, Arnold D., Jr., to Lockheed Missiles & Space Co., Inc. Coal pump. 4,422,809, Cl. 406-98.000.

Bonvoisin, Jacques, to Compagnie Internationale des Pieux Armes Frankignoul. Process for construction of an underground structure and the structure thus obtained. 4,422,798, Cl. 405-132.000.

Boosen, Karl-Josef: *See—*
Duc, Laurent; Boosen, Karl-Josef; and Marrel, Jean-Francois, 4,423,217, Cl. 544-267.000.

Bordelon, Kent J.; Eschenbacher, Robert C.; and Bridendall, William H., to Olin Corporation. Spray drying apparatus for available chlorine-containing compounds. 4,422,900, Cl. 159-48.100.

Borders, Ernest D., to Applied Products, Inc. Ground level dump unit. 4,422,814, Cl. 414-303.000.

Borg-Warner Corporation: *See—*
Braybrook, Kenneth A., 4,422,231, Cl. 29-509.000.

Bories, David: *See—*
Walker, Ralph; and Bories, David, 4,422,409, Cl. 119-51.110.

Boring, Douglas J., to Conair, Inc. Apparatus for transporting pneumatically suspended particulates from a source to a plurality of receivers. 4,422,810, Cl. 406-156.000.

Boston Edison Company: *See—*
Ruscitto, Robert A., 4,422,679, Cl. 292-307.00R.

Bostroem, Theodore. Dipless metallizing apparatus. 4,422,403, Cl. 118-63.000.

Boswell, Fred A. Controlled wind motor. 4,422,825, Cl. 416-132.00B.

Bourdon, Bernard: *See—*
Bessot, Jean-Jacques; and Bourdon, Bernard, 4,422,407, Cl. 118-723.000.

Bout, Bernardus J.: *See—*
van der Walt, Nicolaas T.; Bout, Bernardus J.; and Newington, Timothy J., 4,423,411, Cl. 340-629.000.

Bowman, William W., to Hoffman Controls Corp. Proportional motor drive control. 4,422,571, Cl. 236-49.000.

Brace, Arthur W.; and Chmielewski, James M. Ice scraper. 4,422,206, Cl. 15-236.00R.

Brady, Robert T.; and Guyon, James G., to Vapor Corporation. Door seal. 4,422,387, Cl. 110-173.00R.

Braithwaite, John D.; King, Derrick O.; and Williams, Sidney J., to Black & Decker Inc. Apparatus for feeding a liquid to an applicator. 4,422,788, Cl. 401-188.00R.

Brajder, Antonio, to Siemens Aktiengesellschaft. Overload protection circuit for a semiconductor switch. 4,423,457, Cl. 361-86.000.

Brandstetter, Franz; Echte, Adolf; Hambrecht, Juergen; Illers, Karl H.; and Priebe, Edmund, to BASF Aktiengesellschaft. Thermoplastic molding materials. 4,423,187, Cl. 525-68.000.

Branston, Keith, to Jacobi-Branston Inc. Multistation grinding machine. 4,422,265, Cl. 51-52.00R.

Brasseux, Gerald G., to Dominion Chain Inc. Lever-type load binder. 4,422,218, Cl. 24-68.0CT.

Braun Aktiengesellschaft: *See—*
Falkenbach, Gunther; Seuwen, Dieter; Schneider, Jurgen; and Kahlcke, Hartwig, 4,422,343, Cl. 74-16.000.

Braxter, Lorenzo C., Sr. Bathing appliance. 4,422,205, Cl. 15-222.000.

Braybrook, Kenneth A., to Borg-Warner Corporation. Method of forming a block for a metal belt. 4,422,231, Cl. 29-509.000.

Breidenbach, Dieter; and Moseibach, Wilhelm, to WSW Stahl-Und Wasserbau GmbH. Method of operating a coke ovea. 4,422,902, Cl. 201-14.000.

Brennan, James F.: *See—*
Chen, Gwendyline Y. Y. T.; and Brennan, James F., 4,423,135, Cl. 430-271.000.

Bretschneider, Gerd: *See—*
Mittelmann, Gerhard; Brodbeck, Klaus P.; and Bretschneider, Gerd, 4,422,558, Cl. 220-1.500.

Bricklemyer, Bruce A.: *See—*
Kowalczyk, Dennis C.; Bricklemyer, Bruce A.; and Svoboda, Joseph J., 4,422,927, Cl. 208-211.000.

Bridendall, William H.: *See—*
Bordelon, Kent J.; Eschenbacher, Robert C.; and Bridendall, William H., 4,422,900, Cl. 159-48.100.

Brissonneau et Lotz Marine: *See—*
Charonnat, Henri, 4,422,683, Cl. 294-86.0LS.

British Aerospace Public Limited Company: *See—*
Payne, Dennis J.; Mansbridge, Martin H.; Norton, John; and Swadling, Sidney J., 4,422,569, Cl. 228-173.00C.

Brizgys, Bernardas; and Gallagher, James A., to BASF Wyandotte Corporation. Organic zirconium compounds to reduce viscosity of filled liquid polymers. 4,423,180, Cl. 524-394.000.

Brock, Christopher W.: *See—*
Armfield, Stephen C.; and Brock, Christopher W., 4,422,781, Cl. 400-18.000.

Brodbeck, Klaus P.: *See—*
Mittelmann, Gerhard; Brodbeck, Klaus P.; and Bretschneider, Gerd, 4,422,558, Cl. 220-1.500.

Brodsky, Roy: *See—*
Solomon, Donald F., 4,422,768, Cl. 366-110.000.

Broski, Stanley M., Jr., to Merchants Metals, Inc. Prefabrication fence panel construction for dog kennels and the like. 4,422,622, Cl. 256-25.000.

Brower, Ronald W.; Chiao, Samuel Y.; Pfeifer, Robert F.; and Romano-Moran, Roberto, to NCR Corporation. Polysilicon-doped-first CMOS process. 4,422,885, Cl. 148-1.500.

Brown, Ben C.: *See—*
Chafin, William J.; and Brown, Ben C., 4,422,494, Cl. 164-80.000.

Brown, Dale G., to American Cyanamid Company. Cyanovinyl pyrethroids and pesticidal use thereof. 4,423,062, Cl. 424-275.000.

Brown, David; Dowell, Robert I.; Hargreaves, Rodney B.; and Main, Brian, to Imperial Chemical Industries PLC. Thiadizines. 4,423,045, Cl. 424-246.000.

Brown, Louis E.: *See—*
Jachowski, Ronald E.; and Brown, Louis E., 4,423,398, Cl. 333-229.000.

Brown, Roger K.; and Deak, Charles K. Composite wire for forming wear resistant coatings, and method of manufacture. 4,423,119, Cl. 428-558.000.

Brown, Ronald L.: *See—*
Hargrove, Arthur K.; and Brown, Ronald L., 4,423,482, Cl. 364-200.000.

Brown, Timothy E.: *See—*
Luchessa, Charles E.; and Brown, Timothy E., 4,422,328, Cl. 73-313.000.

Bruckner Apparatebau GmbH: *See—*
Pfeiffer, Manfred; and Schuierer, Manfred, 4,422,308, Cl. 68-13.00R.

Bruder, Frank J.: *See—*
Chesemore, James R.; and Bruder, Frank J., 4,423,300, Cl. 200-339.000.

Brueninghaus Hydraulik GmbH: *See—*
Berthold, Heinz, 4,422,367, Cl. 91-484.000.

Brune, Peter S.: *See—*
Baranczuk, Richard J., 4,423,151, Cl. 436-8.000.

Brunson, Amber N.; Brunson, Deighton E.; and Ray, Walter W., Jr., to Brunson Instrument Co. Dual axis capacitive inclination sensor. 4,422,243, Cl. 33-366.000.

Brunson, Deighton E.: *See—*
Brunson, Amber N.; Brunson, Deighton E.; and Ray, Walter W., Jr., 4,422,243, Cl. 33-366.000.

Brunson Instrument Co.: *See—*
Brunson, Amber N.; Brunson, Deighton E.; and Ray, Walter W., Jr., 4,422,243, Cl. 33-366.000.

Bryant, David M.; Corbeil, Ryn C.; Malcolm, Michael A.; and Thompson, Donald R., to Burroughs Corporation. System and method for name-lookup in a local area network data communication system. 4,423,414, Cl. 340-825.070.

Bryant, Robert J., to Sterling Drug Inc. Process for substitution of aromatic organic compounds. 4,422,955, Cl. 502-169.000.

Buchanan, William T. Sump drain system. 4,422,829, Cl. 417-40.000.

Buckenham, Howard A.; Feldman, Hugh V.; Gotley, Paul; and Young, Richard, to Neotronics Limited. Apparatus for measuring the efficiency of combustion appliances. 4,423,487, Cl. 364-551.000.

Budd Company, The: *See—*
Santos, Gerard R., 4,422,614, Cl. 248-475.00R.

Buist, Ian A.: *See—*
McAllister, Ian R.; Buist, Ian A.; and Pistruzak, William M., 4,422,797, Cl. 405-70.000.

Bullock, Randolph A.; and Mason, Lawrence J., to Xerox Corporation. Phase controlled regulated power supply. 4,423,478, Cl. 363-89.000.

Bunge, Konrad: *See—*
Thurm, Siegfried; and Bunge, Konrad, 4,422,752, Cl. 355-41.000.

Burchett, William C.: *See—*
Adams, Billy R.; and Burchett, William C., 4,422,258, Cl. 43-17.000.

Burgard, Michel; Piteau, Marc D.; Rollat, Alain J.; and Senet, Jean-Pierre G., to Societe Nationale des Poudres et Explosifs. Carbonates carrying cyclic carbonate groups. 4,423,235, Cl. 549-229.000.

Burke, Derek C.: *See—*
Secher, David S.; and Burke, Derek C., 4,423,147, Cl. 435-68.000.

Burke, Peter G., to Gibeshemael Incorporation. Marine system for unloading and loading bulk product. 4,422,400, Cl. 114-73.000.

Burns, William T., Jr. Sparkling wine bottle opener. 4,422,355, Cl. 81-3.360.

Burr-Brown Research Corporation: *See—*
Naylor, Jimmy R.; Lillis, William J.; and Wang, Anthony D., 4,423,409, Cl. 340-347.0DA.

Burrington, J. D.: *See—*
Grasselli, R. K.; Burrington, J. D.; Pesa, F. A.; and Hardman, H. F., 4,422,980, Cl. 260-465.80D.

Burroughs Corporation: *See—*
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Frandsen, Jorgen, 4,423,448, Cl. 360-106.000.
Pileri, Douglas C., 4,423,380, Cl. 324-73.00R.
Roesner, Bruce B., 4,423,490, Cl. 365-149.000.

Burton, Charles V., to Abbott-Northwestern Hospital, Inc. Gravity traction vest. 4,422,452, Cl. 128-75.000.

Bush, Edward A. Pool ball holder and spotting device. 4,422,637, Cl. 273-22.000.

Bush, Elmer R., to L. Barker & Williamson, Inc. Broad bandwidth folded dipole antenna. 4,423,423, Cl. 343-803.000.

Bussemeier, Bernd; Cornils, Boy; and Frohning, Carl-Dieter, to Ruhrchemie Aktiengesellschaft. Process for preparing unsaturated hydrocarbons. 4,423,156, Cl. 518-717.000.

Bussiere, Guy: *See—*
Devos, Francis; Bussiere, Guy; and Huchette, Michel, 4,423,086, Cl. 427-3.000.

Bussiere, Jean L. Turbine air battery charger & power unit. 4,423,368, Cl. 322-35.000.

Buto, Hideo: *See—*
Higuchi, Takeshi; Yoshikawa, Kazuo; and Buto, Hideo, 4,422,722, Cl. 350-173.000.

Buxe, Paul M.; Marshall, James F.; and Smith, Paul A., Jr., to United Technologies Corporation. Blade root seal. 4,422,827, Cl. 416-193.00A.

Byrnes, Herbert P.; and Wahl, Richard, to International Business Machines Corporation. Contact probe assembly having rotatable contacting probe elements. 4,423,376, Cl. 324-158.00P.

C-I-L Inc.: *See—*
Jorgenson, Gordon K., 4,422,380, Cl. 102-313.000.
Marz, Horst F., 4,422,382, Cl. 102-331.000.

Cables Cortaillod S.A.: *See—*
Benoit, Pierre; Pellaux, Jean-Paul; Widmer, Gilbert; Kerllenevich, Betty; and Coche, Andre, 4,422,714, Cl. 350-96.150.

Caboche, Jean-Jacques: *See—*
Devos, Francis; Delobeau, Didier; Caboche, Jean-Jacques; Lemay, Patrick; and Huchette, Michel, 4,422,881, Cl. 127-46.100.

Cabot Corporation: *See—*
Rappas, Alkis S.; and Allen, Lloyd R., 4,423,014, Cl. 423-139.000.

Cadawas, Thomas L. Phonograph tone arm suspension. 4,423,501, Cl. 369-253.000.

Calkins, Dennis E.: *See—*
Green, William L.; Calkins, Dennis E.; Harrison, Gary E.; and Wilkins, Jesse R., 4,422,799, Cl. 405-158.000.

Callaway, Milton A.; and Stutzman, Thomas F., to Simmons U.S.A. Corporation. Thermally controllable heating matress. 4,423,308, Cl. 219-217.000.

Campbell, David K., to Harris Corporation. Digital filter employing PROM for storing positive and negative impulse response values. 4,423,488, Cl. 364-724.000.

Campbell, Gary L., to Deere & Company. Connecting rod. 4,422,348, Cl. 74-579.00E.

Campbell, Willis R.; and Eggers, Edward T., to Sperry Corporation. Baling machine with air spring means for maintaining apron tension. 4,422,374, Cl. 100-88.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Couture, Joseph E. G.; and Twardawa, Philip A., 4,422,383, Cl. 102-364.000.

Canadian General Electric Company Limited: *See—*
Moorby, Donald G.; McMillen, Graham T.; and Flemons, Ralph S., 4,422,320, Cl. 73-12.000.

Cannata, Vincenzo; and Tamerlani, Giancarlo, to Alfa Chemicals Italiana S.p.A. Process for the preparation of the d-2-(6-methoxy-2-naphthyl)-propionic acid. 4,423,244, Cl. 562-466.000.

Canon Kabushiki Kaisha: *See—*
Hoshino, Osamu; Ito, Michio; and Takeuchi, Akihiko, 4,422,749, Cl. 355-3.0DD.
Isohata, Junji; and Yamamoto, Hironori, 4,422,754, Cl. 355-43.000.
Kanbe, Junichiro; Shirai, Shigeru; Ogawa, Kyosuke; Saitoh, Keishi; and Osato, Yoichi, 4,423,133, Cl. 430-95.000.
Kawai, Tohru; and Sumi, Akiyasu, 4,422,740, Cl. 354-25.000.
Kitamura, Takashi, 4,423,426, Cl. 346-108.000.
Komiya, Yutaka; and Takada, Koichi, 4,422,751, Cl. 355-14.0SH.
Kondo, Hideyo; and Touma, Hitoshi, 4,423,132, Cl. 430-67.000.
Masunaga, Makoto; Kinoshita, Takao; Sakane, Toshio; Tsunekawa, Tokuichi; Hosoe, Kazuya; Amikura, Takashi; and Harigaya, Isao, 4,422,741, Cl. 354-403.000.
Suzuki, Ryoichi; and Uchiyama, Takashi, 4,422,729, Cl. 350-336.000.
Takasu, Yoshio; Sakai, Kiyoshi; Mabuchi, Minoru; Ishikawa, Shozo; and Watanabe, Katsunori, 4,423,129, Cl. 430-59.000.
Tanaka, Kazuo; and Ikemori, Keiji, 4,422,734, Cl. 350-422.000.
Uchidoi, Masanori; and Urushihara, Kazunobu, 4,422,747, Cl. 354-458.000.
Watanabe, Asao, 4,423,439, Cl. 358-287.000.

Capitol Stampings Corp.: *See—*
Statz, Robert G.; and Belson, William W., 4,422,434, Cl. 126-438.000.

Capolupo & Gundal, Inc.: *See—*
Capolupo, Richard E., 4,422,964, Cl. 252-628.000.

Capolupo, Richard E., to Capolupo & Gundal, Inc. Radioactive waste container with immobilization compartment and method. 4,422,964, Cl. 252-628.000.

Carl Freudenberg, Firma: *See—*
Hamaekers, Arno; Ticks, Gerd-Heinz; and Rudolf, Hans-Joachim, 4,422,779, Cl. 384-99.000.

Carl Hasse & Wrede GmbH: *See—*
Conseur, Joachim, 4,422,347, Cl. 74-574.000.

Carl Still GmbH & Co. KG, Firma: *See—*
Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst, 4,422,846, Cl. 432-18.000.
Weber, Heinrich; Dungs, Horst; and Tippmer, Kurt, 4,422,858, Cl. 48-197.00R.

Carl Still GmbH & KG, Firma: *See—*
Weber, Heinrich; Dungs, Horst; and Tippmer, Kurt, 4,422,857, Cl. 48-197.00R.

Carl Walther GmbH: *See—*
Maucher, Hans; Zanner, Georg; and Repa, Otto, 4,422,256, Cl. 42-73.000.

Carl, William P.; and Ezzell, Bobby R., to Dow Chemical Company, The. Preparation of halofluoroalkyl ethers. 4,423,249, Cl. 568-655.000.

Carlson, Alfred J. Range jaws for milling machine vises. 4,422,629, Cl. 269-282.000.

Carlson, John A., to Sterling Drug Inc. Antibacterial and antiprotozoal 1-methyl-5-nitro-2-(2-phenylvinyl)imidazoles. 4,423,046, Cl. 424-248.400.

Carnahan, Russell W.: *See—*
Bauernfeind, John; Carnahan, Russell W.; Lodal, Norman; and Vazquez, Domingo, 4,423,082, Cl. 426-557.000.

Carney, Ronald E.: *See—*
McAlpine, James B.; and Carney, Ronald E., 4,423,210, Cl. 536-16.100.

Carpenter, Britt C., to John D. Brush & Co., Inc. Safe and method of making the same. 4,422,386, Cl. 109-59.00R.

Carter, Barry E. Device for improving piano tone quality. 4,422,360, Cl. 84-1.110.

Caruso, Paul J., to Union Carbide Corporation. Herbicidal composition. 4,423,241, Cl. 560-35.000.

Casacci, Severin; and Jarriand, Paul, to Neyrpic. Propeller runner having swivelling blades for turbines. 4,422,826, Cl. 416-157.00R.
Casals-Stenzel, Jorge: *See—*
Skuballa, Werner; Raduchel, Bernd; Schwarz, Norbert; Vorbruggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., 4,423,067, Cl. 424-305.000.
Casio Computer Co., Ltd.: *See—*
Ishii, Hiroshi; and Ishida, Hideaki, 4,422,361, Cl. 84-1.180.
Iwaki, Shunichi, 4,422,365, Cl. 84-478.000.
Casma di Vi Marinoni & Figli: *See—*
Marinoni, Mario, 4,422,213, Cl. 16-71.000.
Cassaday, Michael M.; and Smith, John L., to Technicon Instruments Corporation. Apparatus and method for the non-invasive mixing of a flowing fluid streak. 4,422,773, Cl. 366-341.000.
Castle & Cooke Techniculture, Inc.: *See—*
Armstrong, Errol C.; Hanacek, William A.; Hermann, Paul F.; and Kennedy, Thorburn S., 4,422,990, Cl. 264-45.300.
Caterpillar Tractor Co.: *See—*
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Celanese Corporation: *See—*
Choe, Eui W., 4,423,202, Cl. 528-179.000.
Foley, Paul, 4,422,977, Cl. 260-455.00R.
Hicks, Darrell D., 4,423,201, Cl. 528-76.000.
Censtor Corporation: *See—*
Hamilton, Harold J., 4,423,450, Cl. 360-111.000.
Central Soya Company, Inc.: *See—*
Trainor, Thomas M.; and Sullivan, Daniel R., 4,423,084, Cl. 426-589.000.
Centre de Recherche Industrielle du Quebec: *See—*
Lacroix, Paul H.; and Lacasse, Ernest, 4,422,488, Cl. 144-368.000.
Centronics Data Computer Corp.: *See—*
Armfield, Stephen C.; and Brock, Christopher W., 4,422,781, Cl. 400-18.000.
Ceramic Cooling Tower Company: *See—*
Bardo, Charles J.; and Green, Andrew, 4,422,983, Cl. 261-24.000.
Cespon, Manuel, to Ciba-Geigy Corporation. Coating compositions for the production of a recording material. 4,422,671, Cl. 282-27.500.
Cessna Aircraft Company, The: *See—*
Jackson, Alan D.; and Stucky, Dennis J., 4,422,470, Cl. 137-484.200.
Cetus Corporation: *See—*
Amon, William F., Jr.; Geigert, John; and Neidleman, Saul L., 4,423,149, Cl. 435-105.000.
Chafin, William J.; and Brown, Ben C., to General Motors Corporation. Vibratory forming of shaped lead joints. 4,422,494, Cl. 164-80.000.
Chamberlain, Joseph G. Jacketed wood stove. 4,422,436, Cl. 126-61.000.
Champion International Corporation: *See—*
Meeker, David M., 4,422,241, Cl. 33-1.0BB.
Rathbone, James W., 4,422,590, Cl. 242-68.300.
Champion Spark Plug Italiana S.p.A.: *See—*
Maiocco, Giuseppe A.; and Vidoni, Sergio, 4,422,207, Cl. 15-250.420.
Chang, Ching-Jen; and Stevens, Travis E., to Rohm and Haas Company. Acrylamide containing emulsion copolymers for thickening purposes. 4,423,199, Cl. 526-307.600.
Chang, Clarence D.: *See—*
Bell, Weldon K.; and Chang, Clarence D., 4,423,155, Cl. 502-38.000.
Chapman, Orville B.; and Prufer, George O. Moldboard bit installing tool and method. 4,422,228, Cl. 29-148.300.
Charipar, Joseph: *See—*
Everett, Montague; and Charipar, Joseph, 4,422,748, Cl. 354-316.000.
Charity, Betty. Soap dish. 4,422,546, Cl. 206-77.100.
Charles, Barry G.: *See—*
Child, Robert P.; and Charles, Barry G., 4,422,371, Cl. 99-323.100.
Charles Machine Works, Inc., The: *See—*
Deken, Arthur D., 4,422,794, Cl. 403-330.000.
Charney, Joseph C.; Goodman, Phillip M.; and Morgan, Robert H. Fluid applicator with feeder roller. 4,422,789, Cl. 401-218.000.
Charollais Bataille, Nicole J. J.: *See—*
Bataille, Jean R.; and Charollais Bataille, Nicole J. J., 4,422,248, Cl. 36-121.000.
Charonnat, Henri, to Brissonneau et Lotz Marine. Level detector and its application to a grabbing apparatus for containers or the like. 4,422,683, Cl. 294-86.0LS.
Chatterjee, Pronoy K.: *See—*
Kopolow, Stephen L.; and Chatterjee, Pronoy K., 4,423,184, Cl. 525-57.000.
Chavany, Jean C.; and Koreicho, Wladimir, to Societe Anonyme de Telecommunications. System for guiding a missile by modulated light beam. 4,422,601, Cl. 244-3.130.
Cheeseboro, Robert G. Magnetically recordable label for mechanically-defined information bearing discs. 4,423,503, Cl. 369-290.000.
Cheesman, Barbara E.; and Alikhan, Raza, to Ritmed Limited. Surgical sponge counter and blood loss determination system. 4,422,548, Cl. 206-370.000.
Chemical Systems, Inc.: *See—*
Das, Narayan; and Schaefer, Joy M., 4,422,886, Cl. 148-31.500.
Chemische Werke Huls AG: *See—*
Obenaus, Fritz; Greving, Bernd; Balke, Heinrich; and Scholz, Bernhard, 4,423,271, Cl. 585-639.000.
Chemplex Company: *See—*
Machonis, John, Jr.; Schmukler, Seymour; Zeitlin, Robert J.; and Shida, Mitsuzo, 4,423,117, Cl. 428-475.800.
Chen, Andy C. C.; Rizzuto, Anthony B.; and Veiga, Martin F., to Amstar Corporation. Cocrystallized sugar-nut product. 4,423,085, Cl. 426-632.000.
Chen, Gwendyline Y. Y. T.; and Brennan, James F., to Du Pont de Nemours, E. I., and Company. Preparation of photosensitive block copolymer elements. 4,423,135, Cl. 430-271.000.
Chen, Po-Shiun, to YCI USA, Inc. Machine tool cooling system. 4,422,498, Cl. 165-47.000.
Chermoni, Israel. Lock assembly. 4,422,312, Cl. 70-133.000.
Chernosky, Allen A. Vacuum cleaner attachment for rotary lawnmowers. 4,422,211, Cl. 15-328.000.
Chesemore, James R.; and Bruder, Frank J., to EECO Incorporated. Manually operated detented switch. 4,423,300, Cl. 200-339.000.
Chester, Arthur W.: *See—*
Chu, Yung-Feng; Chou, Tai-Sheng; and Chester, Arthur W., 4,423,265, Cl. 585-322.000.
Chevron Research Company: *See—*
Abbott, Barry J.; and Silcox, William H., 4,422,806, Cl. 405-227.000.
Graf, Peter E.; and Goodrich, Judson E., 4,423,088, Cl. 427-138.000.
Miller, Stephen J., 4,423,268, Cl. 585-533.000.
Miller, Stephen J., 4,423,269, Cl. 585-533.000.
Rosenthal, Joel W.; and Dahlberg, Arthur J., 4,422,922, Cl. 208-8.0LE.
Chi, Chao S., to Sperry Corporation. Thin film magnetic head having disparate poles for pulse asymmetry compensation. 4,423,451, Cl. 360-125.000.
Chi-Ming, Yang: *See—*
Teng-Ching, Weng; and Chi-Ming, Yang, 4,423,465, Cl. 361-394.000.
Chiao, Samuel Y.: *See—*
Brower, Ronald W.; Chiao, Samuel Y.; Pfeifer, Robert F.; and Romano-Moran, Roberto, 4,422,885, Cl. 148-1.500.
Chiba, Masakazu; Kuwakado, Satosi; Takei, Toshihiro; Tsuge, Noboru; and Shimogawa, Toshiaki, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Seat belt tensioning device. 4,422,669, Cl. 280-806.000.
Chiba, Takehisa: *See—*
Iwao, Junichi; Oya, Masayuki; Baba, Toshio; Iso, Tadashi; and Chiba, Takehisa, 4,423,054, Cl. 424-270.000.
Chibana, Masanobu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument of a formant synthesis type. 4,422,362, Cl. 84-1.190.
Chickering, Ronald W.; Yoldas, Bulent E.; and Neuman, Bruce H., to Westinghouse Electric Corp. Nuclear waste encapsulation in borosilicate glass by chemical polymerization. 4,422,965, Cl. 252-629.000.
Chignac, Michel; Grain, Claude; Jammot, Fernand; Pigerol, Charles; Eymard, Pierre; and Ferrandes, Bernard, to Sanofi. Polyol derivatives, processes for preparing the same and their uses in therapeutics. 4,423,071, Cl. 424-311.000.
Chihara, Toshita: *See—*
Wada, Kazuo; Chihara, Toshita; Saito, Tetsuya; and Suzuki, Mitsuo, 4,422,707, Cl. 339-143.00R.
Child, Robert P.; and Charles, Barry G., to Thorn Emi Domestic Electrical Appliances Limited. Aerated drinks machine. 4,422,371, Cl. 99-323.100.
Chisso Corporation: *See—*
Sugimori, Shigeru; Kojima, Tetsukiko; and Tsuji, Masakazu, 4,422,951, Cl. 252-299.630.
Chiyoda Chemical Engineering & Construction Co., Ltd.: *See—*
Shiroto, Yoshimi; Ono, Takeo; Asaoka, Sachio; and Nakamura, Munekazu, 4,422,960, Cl. 502-206.000.
Chmielewski, James M.: *See—*
Brace, Arthur W.; and Chmielewski, James M., 4,422,206, Cl. 15-236.00R.
Choate, Kenneth P., to Robin Shipyard (PTE.) Ltd. Leg load distribution and locking arrangement for jack-up type mobile offshore platform. 4,422,802, Cl. 405-198.000.
Choe, Eui W., to Celanese Corporation. Process for the production of high molecular weight para ordered aromatic heterocyclic polymer. 4,423,202, Cl. 528-179.000.
Chojnowski, Edward M.: *See—*
Kaltz, Milton C.; Chojnowski, Edward M.; Garascia, David C.; Bauer, Barney J.; and George, Richard D., 4,422,687, Cl. 296-221.000.
Chou, Tai-Sheng: *See—*
Chu, Yung-Feng; Chou, Tai-Sheng; and Chester, Arthur W., 4,423,265, Cl. 585-322.000.
Christ, Alfred; Lehmann, Rolf; and Schlatter, Beat, to Escher Wyss Limited. Roller with a roller surface which is to be heated or cooled. 4,422,318, Cl. 72-200.000.
Christe, Karl O.; and Schack, Carl J., to United States of America, Air Force. Method for introducing fluorine into an aromatic ring. 4,423,260, Cl. 570-147.000.
Christenbery, Frederick L., to International Shoe Machine Corporation. Workpiece transporting mechanism. 4,422,197, Cl. 12-1.00A.
Christensen, Gordon D.; and Donaher, Charles J., to Thomas & Betts Corporation. Electrical connector for use with multi-pin arrays. 4,422,703, Cl. 339-74.00R.
Chryst, Milton R. Apparatus for recovering rubber from rubber tires. 4,422,581, Cl. 241-66.000.
Chu, Yung-Feng; Chou, Tai-Sheng; and Chester, Arthur W., to Mobil Oil Corporation. Process for syngas conversions to liquid hydrocarbon products. 4,423,265, Cl. 585-322.000.

Ciba-Geigy Corporation: *See—*
Baschang, Gerhard; Hartmann, Albert; Wacker, Oskar; and Tarcsay, Lajos, 4,423,038, Cl. 424-177.000.
Bohner, Beat; Rempfler, Hermann; and Schurter, Rolf, 4,422,867, Cl. 71-094.000.
Cespon, Manuel, 4,422,671, Cl. 282-27.500.
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,423,059, Cl. 424-274.000.
Ledouble, Jean-Pierre; and Tschopp, Markus, 4,423,220, Cl. 546-22.000.
Lukas, Gerhard; and Atasoy, Kaya, 4,423,043, Cl. 424-229.000.
Mueller, Karl F.; and Heiber, Sonia J., 4,423,099, Cl. 428-35.000.
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,423,231, Cl. 548-451.000.

Cichanowski, Stanley W., to General Electric Company. Polyglycol dielectric capacitor fluid. 4,422,962, Cl. 252-578.000.

Cincinnati Electronics Corporation: *See—*
Stepp, Elvin; and Claypoole, Gary, 4,423,381, Cl. 328-14.000.

Cities Service Company: *See—*
Mueller, Richard A., 4,422,317, Cl. 72-58.000.

City of Hope National Medical Center: *See—*
Tiep, Brian L., 4,422,456, Cl. 128-207.180.

Clarion Co., Ltd.: *See—*
Murayama, Masato; and Manaka, Tetsuyuki, 4,423,293, Cl. 179-156.00R.
Okada, Hitoshi, 4,422,589, Cl. 242-68.100.
Okada, Hitoshi; Takai, Kazuki; and Yamaguchi, Katsumi, 4,423,445, Cl. 360-96.500.
Shirahama, Kengoro, 4,423,395, Cl. 333-193.000.

Clark, Jean B., executrix: *See—*
Konrad, Charles E.; and Clark, Robert C., deceased, 4,423,362, Cl. 318-139.000.

Clark, Keith H., to United States of America, National Aeronautics and Space Administration. Clamp-mount device. 4,422,609, Cl. 248-228.000.

Clark, Robert C.; Lambert, Joe C.; and Thomas, Sherrill G., to General Electric Company. Electrical braking transitioning control. 4,423,363, Cl. 318-375.000.

Clark, Robert C., deceased: *See—*
Konrad, Charles E.; and Clark, Robert C., deceased, 4,423,362, Cl. 318-139.000.

Class, Walter H.; Hurwitt, Steven D.; Hill, Michael L.; and Hutt, Marvin K., to Materials Research Corporation. Magnetically enhanced plasma process and apparatus. 4,422,896, Cl. 156-643.000.

Claypoole, Gary: *See—*
Stepp, Elvin; and Claypoole, Gary, 4,423,381, Cl. 328-14.000.

Cleavenger Associates Inc.: *See—*
Cleavenger, Thomas H., 4,422,596, Cl. 242-129.000.

Cleavenger, Thomas H., to Cleavenger Associates Inc. Dispensing reel. 4,422,596, Cl. 242-129.000.

Clesid S. A.: *See—*
Davene, Jean, 4,423,514, Cl. 373-79.000.

Clinton, Albert J., deceased (by American Fletcher National Bank and Trust Company, Administrator); and O'Doherty, George O. P., to Eli Lilly and Company. Naphthalenamine insecticides. 4,423,065, Cl. 424-304.000.

Close, Donald, to David Hudson, Inc. Fluoroelastomer film compositions and solutions containing fatty polyamide curatives. 4,423,183, Cl. 524-546.000.

Clow, Gary W.: *See—*
Bailey, David F.; Gilmore, Merle L.; Ganucheau, Charles J., Jr.; and Clow, Gary W., 4,423,416, Cl. 340-825.520.

Clum, Charles E.; and Felty, Lanny G., to Johnson & Johnson Products, Inc. Detackifying compositions. 4,423,041, Cl. 424-184.000.

Coal Industry (Patents) Limited: *See—*
Lake, John M.; and Payne, Robert C., 4,422,410, Cl. 122-4.00D.

Cobbs, Walter H., Jr.; and Rehman, William R., to Nordson Corporation. Apparatus and method for dispensing foamable compositions. 4,423,161, Cl. 521-73.000.

Cocain, Harry W.: *See—*
Melby, Earl G.; Cocain, Harry W.; and Fabris, Hubert J., 4,423,193, Cl. 525-296.000.

Coche, Andre: *See—*
Benoit, Pierre; Pellaux, Jean-Paul; Widmer, Gilbert; Kerllenevich, Betty; and Coche, Andre, 4,422,714, Cl. 350-96.150.

Coe Manufacturing Company, The: *See—*
McCurdy, Gerald D., 4,422,487, Cl. 144-245.00R.

Cohen, Choua: *See—*
Maldonado, Paul; Cohen, Choua; and Sillion, Bernard, 4,422,856, Cl. 44-63.000.

Cole, William E. Method and apparatus for infection molding brushes. 4,422,986, Cl. 264-39.000.

Coleman Company, Inc., The: *See—*
Milliman, Keith, 4,422,433, Cl. 124-74.000.

Colgate-Palmolive Company: *See—*
Dillarstone, Alan; and Deistanche, Genevieve B., 4,423,105, Cl. 428-198.000.
Hayes, Harry; and Ahmed, Munir A., 4,423,030, Cl. 424-58.000.

Collin, Pierre K. Shiftable block puzzle. 4,422,641, Cl. 273-153.00S.

Collins, Kenneth L., to Atlantic Richfield Company. Method for gasifying subterranean coal deposits. 4,422,505, Cl. 166-256.000.

Columbia Helicopters, Inc.: *See—*
Patterson, Donald D., 4,422,528, Cl. 182-145.000.

Commissariat a l'Energie Atomique: *See—*
Dubuis, Jean-Charles; Martin, Michel; Piaget, Bernard; Piquard, Jean-Francois; and Vacher, Jacques, 4,422,332, Cl. 73-625.000.

Compagnie des Montres Longines, Francillon S.A.: *See—*
Maire, Aurele; and Perucchi, Norbert, 4,422,776, Cl. 368-185.000.

Compagnie Industrille des Telecommunications Cit-Alcatel: *See—*
Bessot, Jean-Jacques; and Bourdon, Bernard, 4,422,407, Cl. 118-723.000.

Compagnie Internationale des Pieux Armes Frankignoul: *See—*
Bonvoisin, Jacques, 4,422,798, Cl. 405-132.000.

Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme): *See—*
Feissel, M. Henri, 4,423,509, Cl. 371-25.000.

Conair, Inc.: *See—*
Boring, Douglas J., 4,422,810, Cl. 406-156.000.

Concast AG: *See—*
Vickers, David P.; Mayland, Kenneth; and Allan, Gordon K., 4,422,884, Cl. 148-2.000.

Condor Engineering & Manufacturing, Inc.: *See—*
Dorn, Russell J., 4,422,418, Cl. 123-198.00D.

Connecticut Artcraft Corp.: *See—*
Viesturs, Gundar E.; and Viesturs, Eric A., 4,422,194, Cl. 5-451.000.

Connolly, James D. Static screen. 4,422,937, Cl. 210-409.000.

Conoco Inc.: *See—*
Dowling, Robin M.; and Higley, David P., 4,423,267, Cl. 585-531.000.
Fenton, Jeff T., 4,423,238, Cl. 549-368.000.
Smith, Donald L.; Kosowski, Zenon V.; and Marks, Robert R., Jr., 4,422,342, Cl. 73-863.430.
Yang, Kang; Reedy, James D.; McGuire, S. E.; and Kerfoot, O. C., 4,423,278, Cl. 585-823.000.

Conseur, Joachim, to Carl Hasse & Wrede GmbH. Torsional balancer device with a viscous damping medium. 4,422,347, Cl. 74-574.000.

Consiglio Nazionale Delle Ricerche: *See—*
Bini, Marco; Ignesti, Amleto; Millanta, Luigi; Rubino, Nicola; and Vanni, Riccardo, 4,423,372, Cl. 324-72.000.

Consolidated Technology Corporation: *See—*
McGee, William R., 4,422,859, Cl. 55-16.000.

Contato, Ugo, to Fiat Auto S.p.A. Control device for optical and acoustic signalers. 4,423,295, Cl. 200-61.270.

Conti, Richard J.: *See—*
Peeler, George D. M.; Hunt, Chester J.; DaMocogno, Ninalbo G.; and Conti, Richard J., 4,423,421, Cl. 343-771.000.

Cook, Reuben E. Welding helmet. 4,422,185, Cl. 2-8.000.

Cook, Stephen P., to Dowty Mining Equipment Limited. Hydraulically-operated devices. 4,422,808, Cl. 405-302.000.

Cooley, Denton A.: *See—*
Sharp, Russell G.; Wilkinson, William R.; Reed, Charles C.; and Cooley, Denton A., 4,422,939, Cl. 210-445.000.

Cooper, Wilbur H. Lock for a fuel line valve. 4,422,314, Cl. 70-242.000.

Copolymer Rubber & Chemical Corporation: *See—*
Tsai, Tom, 4,423,198, Cl. 526-263.000.

Corbeil, Ryn C.: *See—*
Bryant, David M.; Corbeil, Ryn C.; Malcolm, Michael A.; and Thompson, Donald R., 4,423,414, Cl. 340-825.070.

Corbett, Peter J.; and Aschwanden, Martin G., to Dow Chemical Company, The. Thickened paper coating composition. 4,423,118, Cl. 428-514.000.

Cordani, Eugene J.; Hammonds, James C.; and Vorwerk, Frederick E., to ACF Industries, Incorporated. Hand brake mechanism including force dividing assembly. 4,422,532, Cl. 188-47.000.

Cordis Corporation: *See—*
Pohndorf, Peter J., 4,422,460, Cl. 128-786.000.

Corley, Wallace T.; and Dorsey, David L., to Mayco Wellchem, Inc. Lost circulation material. 4,422,948, Cl. 252-8.5LC.

Corley, Wallace T.: *See—*
Dorsey, David L.; and Corley, Wallace T., 4,422,947, Cl. 252-8.50C.

Cornils, Boy: *See—*
Bussemeier, Bernd; Cornils, Boy; and Frohning, Carl-Dieter, 4,423,156, Cl. 518-717.000.

Corson, Frederick P.: *See—*
Wolfe, David L.; and Corson, Frederick P., 4,423,206, Cl. 528-416.000.

Corvan, Peter J.; Kaeding, Jeanne E.; Rodriguez, Cesar; and Rule, Norman G., to Eastman Kodak Company. Electrically photosensitive polymers containing vinylene-1,4-phenylene-imino-1,4-phenylene-vinylenearylene groups. 4,423,203, Cl. 528-266.000.

Costello, William D.; Helton, Charles J., III; and Frank, Martin B., to American Hospital Supply Corporation. Removable wheel assembly for wheelchairs. 4,422,660, Cl. 280-242.0WC.

Cosyns, Jean: *See—*
Juguin, Bernard; Cosyns, Jean; and Miquel, Jean, 4,423,264, Cl. 585-255.000.

Coughlin, William J.: *See—*
Johnson, David E.; McCall, Kenneth E.; and Coughlin, William J., 4,422,384, Cl. 105-29.00R.

Cousino, James L.; Nalewick, James A.; and Hills, Blair H., to Bofors Nobel, Incorporated. Method of neutralizing and detoxifying wastes containing organic compounds. 4,422,940, Cl. 210-631.000.

Couture, Joseph E. G.; and Twardawa, Philip A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Peripheral burning incendiary device. 4,422,383, Cl. 102-364.000.

Couvrette, Guy. Toilet seat sanitary fixture. 4,422,189, Cl. 4-420.200.

Covington, William S., to Danker Laboratories, Inc. Ocular membrane and method for preparation thereof. 4,423,195, Cl. 525-479.000.

CPC International Inc.: *See*—
Heady, Robert E., 4,423,150, Cl. 435-193.000.
Cray, Nicholas K.; Murrin, Frederick L.; and Maupin, Phillip E., to R. D. Werner Co., Inc. Picture frame easels. 4,422,613, Cl. 248-473.000.
Crescenzi, Emil J., Jr.; Wilser, Walter T.; Oglesbee, Richard W.; and Gold, Richard B., to Watkins-Johnson Company. RF Amplifier circuit employing FET devices. 4,423,388, Cl. 330-277.000.
Crivello, James V.; and Moore, James E., to General Electric Company. Free radical curable resin compositions containing triarylsulfonium salt. 4,423,136, Cl. 430-281.000.
Croci, Dana; and Kaplon, David A., to AMP Incorporated. Multiple transducer connector. 4,422,709, Cl. 339-176.0MF.
Cromas, Joseph C.; and McQuillan, Charles M., to TRW Inc. Method and apparatus for fuel control in fuel injected internal combustion engines. 4,422,420, Cl. 123-352.000.
Crown Zellerbach Corporation: *See*—
Reba, Imants, 4,422,565, Cl. 226-97.000.
Crucible Society Anonyme: *See*—
van der Walt, Nicolaas T.; Bout, Bernardus J.; and Newington, Timothy J., 4,423,411, Cl. 340-629.000.
CTS Corporation: *See*—
Hunt, Roger W.; Miller, Brian T.; and Schroeder, Donald R., 4,422,226, Cl. 29-25.350.
Cushing, Emmet J. Golf swing training device. 4,422,643, Cl. 273-183.00B.
Cusick, Joseph B., III. Collapsible swning frame. 4,422,491, Cl. 160-58.00R.
Cyborex Laboratories, Inc.: *See*—
Gurr, George P., 4,423,335, Cl. 307-31.000.
Dahlberg, Arthur J.: *See*—
Rosenthal, Joel W.; and Dahlberg, Arthur J., 4,422,922, Cl. 208-8.0LE.
Daly, Robert C.; Thompson, Danny R.; and Farid, Samir Y., to Eastman Kodak Company. Novel light-sensitive compounds and photoreactable compositions comprising same. 4,422,972, Cl. 260-368.000.
Dalzell, Haldean C.: *See*—
Razdan, Raj K.; and Dalzell, Haldean C., 4,423,221, Cl. 546-74.000.
D'Amico, John J., to Monsanto Company. Imides derived from 2-thioxo-3-(benzox (thia) azoline acetic and propionic acids. 4,422,865, Cl. 71-90.000.
DaMocogno, Ninalbo G.: *See*—
Peeler, George D. M.; Hunt, Chester J.; DaMocogno, Ninalbo G.; and Conti, Richard J., 4,423,421, Cl. 343-771.000.
Danek Medical, Inc.: *See*—
Olsen, Alan J., 4,422,455, Cl. 128-134.000.
Danhof, Bernard, to Western Automation Corporation. Machine tool support and discharge apparatus. 4,422,815, Cl. 414-222.000.
Daniel, Arnold D., Jr.: *See*—
Bonin, John H.; Meyer, John W.; and Daniel, Arnold D., Jr., 4,422,809, Cl. 406-98.000.
Danker Laboratories, Inc.: *See*—
Covington, William S., 4,423,195, Cl. 525-479.000.
Danly, Donald E.: *See*—
Lester, J. Harvey, Jr.; and Danly, Donald E., 4,423,018, Cl. 423-243.000.
Danno, Tsuneo; Kanno, Masashi; and Murata, Eiichiro, to Matsushita Electric Industrial Co., Ltd. Code sequence synchronization system for spread spectrum communication receiver. 4,423,517, Cl. 375-1.000.
Danton, Jean-Louis, to Etablissements M. Duret & Fils. Covering structure for seating or the like. 4,423,102, Cl. 428-92.000.
Darley, Kenneth S.; Dyson, David V.; and Grimshaw, David J., to Griffith Laboratories, Limited, The. Production of oriental-style breading crumbs. 4,423,078, Cl. 426-20.000.
Dart Industries, Inc.: *See*—
Zuckerman, Matthew, 4,423,407, Cl. 338-34.000.
Das, Narayan; and Schaefer, Joy M., to Chemical Systems, Inc. Surface treatment for aluminum and aluminum alloys. 4,422,886, Cl. 148-31.500.
Dashnier, Merwin J.; Diring, James A.; and Krueger, Donald G., to Wisconsin Tissue Mills, Inc. Toilet paper dispenser with swinging mandrels. 4,422,584, Cl. 242-55.300.
da Silva, Herman, to Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telefonie). Radiocommunication system in which a receiving station monitors a number of transmitters by time division. 4,423,413, Cl. 340-825.030.
Dataproducts Corporation: *See*—
Arzoumanian, Aram S.; Hieber, Heinz W.; Nojiri, Howard H.; and Hart, Jimmie L., 4,422,784, Cl. 400-144.200.
Jezbera, Val K., 4,422,377, Cl. 101-93.290.
Davene, Jean, to Clesid S. A. Continuously fed electric furnace for melting scrap iron. 4,423,514, Cl. 373-79.000.
David Hudson, Inc.: *See*—
Close, Donald, 4,423,183, Cl. 524-546.000.
Daviduk, Nicholas; and Haddad, James H., to Mobil Oil Corporation. Method for converting alcohols to hydrocarbons. 4,423,274, Cl. 585-640.000.
Davies, Glyndwr J., to Glacier Metal Company Limited, The. Method of applying polyarylene sulphide compositions to a bearing. 4,423,093, Cl. 427-385.500.
Davis, Robert B.; and Delano, Mark A., to Union Carbide Corporation. Process for cooling and fluidizing. 4,422,302, Cl. 62-57.000.
Daxer, Wolfgang: *See*—
Zwicker, Eberhard; and Daxer, Wolfgang, 4,423,291, Cl. 381-43.000.
Dayco Corporation: *See*—
Phillips, Alfred R., 4,422,991, Cl. 264-83.000.
Deak, Charles K.: *See*—
Brown, Roger K.; and Deak, Charles K., 4,423,119, Cl. 428-558.000.
Dean, Anthony M., to Exxon Research and Engineering Co. Process for reducing NO emissions. 4,423,017, Cl. 423-235.000.
de Angeli, Michael M. Exercise apparatus. 4,422,636, Cl. 272-117.000.
Dearlove, Thomas J.; Gray, Richard K.; and Atkins, Richard P., to General Motors Corporation. Durable cast epoxy tooling composition. 4,423,094, Cl. 427-386.000.
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Debney, Howard A.; and Spencer, Darrell C., 4,422,934, Cl. 210-222.000.
DeBock, Richard M., to Motorola, Inc. Asynchronous multi-port arbiter. 4,423,384, Cl. 328-152.000.
De Burgos Garcia, Eduardo; Goni Unzue, A. Javier; Gutierrez Barranco, Juan M.; and Pajares Suarez, Juan A., to Junta de Energia Nuclear. Gamma radiation detector probe with a halogen-quenched Geiger-Muller tube, compensated for dead time. 4,423,329, Cl. 250-374.000.
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Ellison, Bruce; and DeCarteret, James A., 4,422,811, Cl. 408-204.000.
Decibel Products, Inc.: *See*—
Jachowski, Ronald E.; and Brown, Louis E., 4,423,398, Cl. 333-229.000.
Decoene, Frans J. G. C., to Sperry Corporation. Drive mechanism for rotary cleaning device. 4,422,462, Cl. 130-27.0AA.
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Campbell, Gary L., 4,422,348, Cl. 74-579.00E.
De Long, James E., 4,423,513, Cl. 373-76.000.
Espiritu Santo, Eugenio; and Baxter, Kenneth D., 4,422,341, Cl. 73-862.640.
Green, Merlin G., 4,422,345, Cl. 74-471.0XY.
Shatuck, Lawrence A., 4,422,536, Cl. 192-3.570.
Swanson, Larry D., 4,422,657, Cl. 280-21.00R.
West, Neil L., 4,422,463, Cl. 130-27.0HA.
Defaucheux, Jacques: *See*—
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Deforeit, Christian J., to Matth. Hohner AG. Method for digitally controlling the envelope curve in a polyphonic musical synthesizer and circuitry to implement the method. 4,422,363, Cl. 84-1.260.
Deigner, Paul: *See*—
Felleisen, Peter; Mayer, Dieter; Koester, Eberhard; Domas, Friedrich; and Deigner, Paul, 4,423,454, Cl. 360-135.000.
Deken, Arthur D., to Charles Machine Works, Inc., The. Coupling for earth boring units. 4,422,794, Cl. 403-330.000.
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Davis, Robert B.; and Delano, Mark A., 4,422,302, Cl. 62-57.000.
Delaunay, Perre P. A.: *See*—
Maillard, Jacques G.; Delaunay, Perre P. A.; and Legeoi, Jacky M. G., 4,423,056, Cl. 424-270.000.
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De Long, James E., to Deere & Company. Furnace panel for use in an arc furnace. 4,423,513, Cl. 373-76.000.
Del Principe, Robert M.; and Oliphant, Peter A., to Mattel, Inc. Electronic football game. 4,422,639, Cl. 273-94.000.
Delstanche, Genevieve B.: *See*—
Dillarstone, Alan; and Delstanche, Genevieve B., 4,423,105, Cl. 428-198.000.
Delta-G Instruments, Inc.: *See*—
Richards, Christopher; and Pelegrin, Karl, 4,422,329, Cl. 73-382.00R.
Demerson, Christopher A.; Humber, Leslie G.; and Ferland, Jean-Marie, to American Home Products Corporation. Tricyclic isoindole derivatives. 4,423,232, Cl. 548-472.000.
den Hollander, Willem, to RCA Corporation. Horizontal deflection circuit with linearity correction. 4,423,358, Cl. 315-371.000.
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Shestopalov, Alexandr A.; Denikin, Ernst I.; Kharkhuta, Nikolai Y.; Vasiliev, Alexandr A.; and Okunev, Vyacheslav I., 4,422,778, Cl. 374-135.000.
Denton, Cleo E. Pendulum structure. 4,422,530, Cl. 185-29.000.
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Gonser, Donald I., 4,422,891, Cl. 156-89.000.
de Ridder, Arie-Jan, to Redexim Holding S.A. Apparatus for the provision of vertical drain channels in grass, fields, meadows etc. 4,422,510, Cl. 172-21.000.
Derner, Paul: *See*—
Mertin, Dietrich; Derner, Paul; and von Reis, Wolf, 4,422,280, Cl. 52-788.000.
Derrien, Michel: *See*—
Turiot, Andre; and Derrien, Michel, 4,422,603, Cl. 244-102.00R.
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Deschaaf, Clifford L., to Whirlpool Corporation. Low voltage sensor for a dryer. 4,422,247, Cl. 34-48.000.
Dessau, Ralph M., to Mobil Oil Corporation. Selective sorption by zeolites. 4,423,280, Cl. 585-829.000.

Deters, Elmer M.: *See*—
LaGrange, Nyle D.; and Deters, Elmer M., 4,422,469, Cl. 137-315.000.

Dettmers, Michael; Weirich, Walter; and Peters, Bernd, to Gewerkschaft Eisenhutte Westfalia. Mine roof supports. 4,422,807, Cl. 405-296.000.

Deutsche Automobilgesellschaft mbH: *See*—
Neumann, Erhard, 4,423,476, Cl. 363-20.000.

Deutsche Babcock Aktiengesellschaft: *See*—
Schroder, Ulrich, 4,422,389, Cl. 110-264.000.

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Devos, Francis; Bussiere, Guy; and Huchette, Michel, to Roquette Freres. Process for hard coating with sorbitol and products obtained thereby. 4,423,086, Cl. 427-3.000.

Dey, Arabinda N., to Duracell Inc. Lithium-metal chromate organic electrolyte cell and method for cathode. 4,423,124, Cl. 429-194.000.

Dholakia, Anil R., to RCA Corporation. Stylus lifting/lowering actuator with air damping. 4,423,500, Cl. 369-230.000.

Diamond, Michael K. Dental instrument and method for positioning a lingual orthodontic bracket. 4,422,849, Cl. 433-3.000.

Diekotter, Friedrich W., to Henkel KGaA. Calcined $\alpha$-alumina filter aids. 4,422,946, Cl. 210-777.000.

Dierberger, James A.; Ackermann, William; and Fine, Arthur D., to United Technologies Corporation. Prestressed combustor liner for gas turbine engine. 4,422,300, Cl. 60-757.000.

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Geirhos, Werner; and Dietmayer, Josef, 4,422,480, Cl. 139-66.00R.

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Goerner, Klaus; Dietze, Manfred; and Birkner, Rainer, 4,422,566, Cl. 226-191.000.

DiGiulio, Adolph V., to Atlantic Richfield Company. Process for forming anti-lumping and fast-cool vinyl aromatic expandable polymer particles. 4,423,160, Cl. 521-59.000.

Dil, Jan G., to U.S. Philips Corporation. Record carrier having an optically readable information structure. 4,423,502, Cl. 369-275.000.

Dillarstone, Alan; and Deistanche, Genevieve B., to Colgate-Palmolive Company. Article for clothes conditioning and method of making same. 4,423,105, Cl. 428-198.000.

Dinger, Hans; and Klotz, Helmut, to MTU-Motoren-und Turbinen-Union Friedrichshafen GmbH. Internal combustion engine with supercharging by exhaust gas turbochargers and an auxiliary combustion chamber. 4,422,296, Cl. 60-606.000.

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Vancelette, Stanley R.; DiNozzi, Robert D.; and Pierson, Mark V., 4,422,232, Cl. 29-564.200.

Diring, James A.: *See*—
Dashnier, Merwin J.; Diring, James A.; and Krueger, Donald G., 4,422,584, Cl. 242-55.300.
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Wilkinson, Richard L., 4,422,904, Cl. 204-5.000.

Disko, Harry: *See*—
Holahan, Edward T.; and Disko, Harry, 4,422,644, Cl. 273-249.000.

Ditcher, Jack, to A-Lok Products, Inc. Method and apparatus for forming inverts in manhole assemblies, and the like. 4,422,994, Cl. 264-219.000.

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Lantzsch, Reinhard; Ditgens, Klaus; Heinemann, Ulrich; Thomas, Rudolf; and Weber, Erhard, 4,423,225, Cl. 548-373.000.

Ditzik, Richard J. Beam addressed electrooptic display system. 4,422,732, Cl. 350-356.000.

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Dr. Boy GmbH: *See*—
Klein, Heinz H., 4,422,294, Cl. 60-565.000.

Dodt, William C.: *See*—
Bauer, Wayne J.; Dodt, William C.; Kirkpatrick, Charles R.; Rehage, Ted A.; Robinson, Francis L.; and Taylor, William K., 4,423,480, Cl. 364-200.000.

Doerge, Herman P., to Koppers Company, Inc. Method of producing phenolic foam using pressure and foam produced by the method. 4,423,163, Cl. 521-181.000.

Dokos, William T.: *See*—
Zerlaut, Gene A.; Dokos, William T.; Putman, William J.; and Skousen, Russell K., 4,423,469, Cl. 362-2.000.

Domas, Friedrich: *See*—
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Brasseux, Gerald G., 4,422,218, Cl. 24-68.0CT.

Donaher, Charles J.: *See*—
Christensen, Gordon D.; and Donaher, Charles J., 4,422,703, Cl. 339-74.00R.

Dorn, Russell J., to Condor Engineering & Manufacturing, Inc. Emergency air shutdown system for a diesel engine. 4,422,418, Cl. 123-198.00D.

Dorn, Silvia; and Schwieter, Ulrich, to Hoffmann-La Roche Inc. Insecticidal compositions. 4,423,042, Cl. 424-200.000.

Dorsey, David L.; and Corley, Wallace T., to Mayco Wellchem, Inc. Wellbore fluid. 4,422,947, Cl. 252-8.50C.

Dorsey, David L.: *See*—
Corley, Wallace T.; and Dorsey, David L., 4,422,948, Cl. 252-8.5LC.

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Sasaki, Noriaki, 4,422,326, Cl. 173-291.000.

Dove, Norman F. Steam distributor with plug valve. 4,422,575, Cl. 239-562.000.

Dow Chemical Company, The: *See*—
Ash, Mary L.; and Pews, Richard G., 4,423,222, Cl. 546-337.000.
Carl, William P.; and Ezzell, Bobby R., 4,423,249, Cl. 568-655.000.
Corbett, Peter J.; and Aschwanden, Martin G., 4,423,118, Cl. 428-514.000.
Larsen, Eric R.; and Ecker, Ernest L., 4,422,913, Cl. 204-158.0HA.
Leboeuf, William E., 4,422,359, Cl. 83-546.000.
Wolfe, David L.; and Corson, Frederick P., 4,423,206, Cl. 528-416.000.
Wolford, Thomas L., 4,423,024, Cl. 423-437.000.

Dow Corning Corporation: *See*—
Blizzard, John D., 4,423,095, Cl. 427-387.000.
Kalinowski, Robert E.; and Vincent, Gary A., 4,423,108, Cl. 428-266.000.

Dowell, Robert I.: *See*—
Brown, David; Dowell, Robert I.; Hargreaves, Rodney B.; and Main, Brian, 4,423,045, Cl. 424-246.000.

Dowling, Robin M.; and Higley, David P., to Conoco Inc. Supported ferric sulfate and cobalt sulfate catalysts for the oligomerization of olefins. 4,423,267, Cl. 585-531.000.

Dowty Mining Equipment Limited: *See*—
Cook, Stephen P., 4,422,808, Cl. 405-302.000.

Dozono, Kichihiko; and Hasegawa, Yoji, to Nissan Motor Company, Ltd. Exhaust gas recirculation system for internal combustion engine. 4,422,431, Cl. 123-568.000.

Dravo Corporation: *See*—
Karnofsky, George B., 4,422,901, Cl. 196-14.520.

Dreyer, Heinz; and Wiemeyer, Benno, to Amazonen Werke AG H. Dreyer. Seed drill with disk-type furrow openers. 4,422,392, Cl. 111-52.000.

Dril-Quip, Inc.: *See*—
Reimert, Larry E., 4,422,507, Cl. 166-348.000.

Droguet, Jean-Paul; and Vernay, Michel, to Societe Anonyme dite, Societe Industrielle des Nouvelles Techniques Radioelectriques. Display unit with half-stud, spacer, connection layer and method of manufacturing. 4,422,731, Cl. 350-344.000.

Drost, James L.: *See*—
Gordin, Myron K.; Drost, James L.; and Mydosh, Bryan L., 4,423,471, Cl. 362-96.000.

Droz, Ralph, to American Sunroof Corporation. Vehicle roof structure. 4,422,686, Cl. 296-219.000.

Drutchas, Gilbert H.; and Suttkus, David J., to TRW Inc. Power steering pump. 4,422,834, Cl. 417-283.000.

DSET Laboratories, Inc.: *See*—
Zerlaut, Gene A.; Dokos, William T.; Putman, William J.; and Skousen, Russell K., 4,423,469, Cl. 362-2.000.

Dubuis, Jean-Charles; Martin, Michel; Piaget, Bernard; Piquard, Jean-Francois; and Vacher, Jacques, to Commissariat a l'Energie Atomique. Dynamic focusing and sectorial scanning echography device. 4,422,332, Cl. 73-625.000.

Duc, Laurent; Boosen, Karl-Josef; and Marrel, Jean-Francois, to Hewlett-Packard Company. Process for the production of heterocyclic thio compounds. 4,423,217, Cl. 544-267.000.

Duchateau, Jacques; and Nicolas, Maurice, to B F G Glassgroup. Method of manufacturing mirrors and mirrors so obtained. 4,422,893, Cl. 156-232.000.

Dungs, Horst: *See*—
Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst, 4,422,846, Cl. 432-18.000.
Weber, Heinrich; Dungs, Horst; and Tippmer, Kurt, 4,422,857, Cl. 48-197.00R.
Weber, Heinrich; Dungs, Horst; and Tippmer, Kurt, 4,422,858, Cl. 48-197.00R.

Dunham, H. E.; Arana, David; Jackson, Terrell D.; McEuen, Brent E.; and Schneider, John A., to Phelps Dodge Corporation. Concentrate burner. 4,422,624, Cl. 266-182.000.

Dupin, Thierry, to Rhone-Poulenc Specialites Chimiques. Catalyst for desulfurization of industrial waste gases and process for preparing the catalyst. 4,422,958, Cl. 502-217.000.

Du Pont de Nemours, E. I., and Company: *See*—
Chen, Gwendyline Y. Y. T.; and Brennan, James F., 4,423,135, Cl. 430-271.000.
Harper, Lee R.; Obetz, Judith E.; and Steinmetz, William H., 4,423,165, Cl. 523-409.000.
Michel, Rudolph H., 4,422,992, Cl. 264-108.000.
Rennolds, Philip J., 4,423,248, Cl. 568-324.000.
Welch, Charles W., 4,422,908, Cl. 204-55.00R.

Duracell Inc.: *See*—
Dey, Arabinda N., 4,423,124, Cl. 429-194.000.

Dusch, Albert, to Pfaff Industriemaschinen GmbH. Top feed device for a sewing machine. 4,422,398, Cl. 112-320.000.

Dusza, Robert J., to American Optical Corporation. Aerosol filter cartridge. 4,422,861, Cl. 55-498.000.

Duthu, Raymond H. Portable barge lights. 4,423,472, Cl. 362-184.000.

Dvornik, Dushan M.; and Simard-Duquesne, Nicole, to Ayerst, McKenna & Harrison Inc. Aldose reductase inhibition by 1-methyl-5-(4-methylbenzoyl)-1H-pyrrole-2-acetic acid. 4,423,060, Cl. 424-274.000.

Dvornik, Dushan M.; and Simard-Duquesne, Nicole, to Ayerst, McKenna & Harrison Inc. Aldose reductase inhibition by 5-fluoro-2-

methyl-1-[[4-(methylthio)phenyl]methylene]-1H-indene-3-acetic acid. 4,423,074, Cl. 424-317.000.

Dvornik, Dushan M.; and Simard-Duquesne, Nicole, to Ayerst, McKenna & Harrison Inc. Aldose reductase inhibition by 5-fluoro-2-methyl-1-[[4-(methylsulfonyl)phenyl]methylene]-1H-indene-3-acetic acid. 4,423,075, Cl. 424-317.000.

Dyar, Harrison G. Thermal insulating system particularly adapted for building construction. 4,422,273, Cl. 52-407.000.

Dynamics Corporation of America: *See*—
Hodgson, Emory R., Jr.; and Rester, Darryl C., 4,422,512, Cl. 172-454.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Luthringshauser, Bruno; and Lindzus, Claus, 4,423,112, Cl. 428-389.000.

Dyson, David V.: *See*—
Darley, Kenneth S.; Dyson, David V.; and Grimshaw, David J., 4,423,078, Cl. 426-20.000.

E.N.I. Electrische Nijverheidsinstallaties: *See*—
Smets, Willy, 4,422,369, Cl. 98-36.000.

E.N.I. l'Electro navale et industrielle: *See*—
Smets, Willy, 4,422,369, Cl. 98-36.000.

E. R. Squibb & Sons, Inc.: *See*—
Ridgway, Frank; and Woolfenden, Richard D. G., 4,422,945, Cl. 210-764.000.

Eagle-Picher Industries, Inc.: *See*—
Beebe, James C., 4,422,336, Cl. 73-769.000.
Perry, Gary D., 4,422,667, Cl. 280-705.000.

Eardley, David B., to International Business Machines Corporation. Single shot multivibrator having reduced recovery time. 4,423,338, Cl. 307-273.000.

Earhart, Jack R.; Langdon, Freddie J.; and Johnson, John K., to Aqua-Aerobic Systems, Inc. Downflow mixer. 4,422,771, Cl. 366-251.000.

Eastman, Jay M., to University of Rochester, The. Interferometer apparatus for microtopography. 4,422,764, Cl. 356-357.000.

Eastman Kodak Company: *See*—
Abel, Edward P., 4,423,141, Cl. 430-454.000.
Corvan, Peter J.; Kaeding, Jeanne E.; Rodriguez, Cesar; and Rule, Norman G., 4,423,203, Cl. 528-266.000.
Daly, Robert C.; Thompson, Danny R.; and Farid, Samir Y., 4,422,972, Cl. 260-368.000.
Guild, John R., 4,423,138, Cl. 430-326.000.
Herz, Arthur H., 4,423,140, Cl. 430-445.000.
Klijanowicz, James E.; and Kovacs, Csaba A., 4,423,126, Cl. 430-9.000.

Eaton Corporation: *See*—
Harris, Steven D.; and Wolfe, Joseph L, 4,422,726, Cl. 350-331.00R.
Sitabkhan, Mansur, 4,422,676, Cl. 285-136.000.
Treadwell, William A., 4,422,518, Cl. 180-175.000.

Eaton, Harry E.; and Novak, Richard C., to United Technologies Corporation. Ceramic faced outer air seal for gas turbine engines. 4,422,648, Cl. 277-53.000.

Eaton, James W.: *See*—
Slocum, Donald H.; and Eaton, James W., 4,422,266, Cl. 52-58.000.

Ebenhoeh, Peter, to Siemens Aktiengesellschaft. Equalizer circuit for communication signals. 4,423,391, Cl. 333-28.00R.

Ebra, Martha A.; and Wallace, Richard M., to United States of America, Energy. Phenolic cation exchange resin material for recovery of cesium and strontium. 4,423,159, Cl. 521-35.000.

Echte, Adolf: *See*—
Brandstetter, Franz; Echte, Adolf; Hambrecht, Juergen; Illers, Karl H.; and Priebe, Edmund, 4,423,187, Cl. 525-68.000.

Ecker, Ernest L.: *See*—
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Eckhardt, Wolfgang: *See*—
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,423,059, Cl. 424-274.000.

Edeleanu Gesellschaft mbH: *See*—
Wirtz, Gerhard; and Maxelon, Rainer, 4,422,923, Cl. 208-33.000.

EECO Incorporated: *See*—
Chesemore, James R.; and Bruder, Frank J., 4,423,300, Cl. 200-339.000.

Eggenberger, Larry. Tensioning device. 4,422,310, Cl. 69-19.300.

Eggers, Edward T.: *See*—
Campbell, Willis R.; and Eggers, Edward T., 4,422,374, Cl. 100-88.000.

Egyt Gyogyszervegyeszeti Gyar: *See*—
Korosi, Jeno; Lang, Tibor; Andrasi, Ferenc; Szekely, Jozsef; Hamori, Tamas; Balogh, Tibor; Ila, Lajos; Goldschmidt, Katalin; Sineger, Eleonora; and Moravcsik, Imre, 4,423,044, Cl. 424-244.000.

Eheim, Franz, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,422,428, Cl. 123-502.000.

Ehrfeld, Wolfgang: *See*—
Becker, Erwin-Willy; Ehrfeld, Wolfgang; Krieg, Gunther; and Bier, Wilhelm, 4,422,905, Cl. 204-9.000.

Eisenhardt, Charles A., Jr. Germicidal ceiling fan blade. 4,422,824, Cl. 416-5.000.

Ejiri, Yoshihiro: *See*—
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Ekern, Paul B. Fence post puller. 4,422,621, Cl. 254-30.000.

Elecompack Company Ltd.: *See*—
Naito, Han-Ichiro; Yamaguchi, Tsuneo; and Harashima, Kiyoshi, 4,422,816, Cl. 414-331.000.

Electric Power Research Institute, Inc.: *See*—
Goedde, Gary L.; and Rice, Charles H., 4,423,404, Cl. 338-21.000.

Elf-France: *See*—
Maldonado, Paul; Cohen, Chosa; and Sillion, Bernard, 4,422,856, Cl. 44-63.000.

El Hamamsy, Mahoud A., to Bell Telephone Laboratories, Incorporated. Normally off bilateral switch. 4,423,330, Cl. 250-551.000.

Eli Lilly and Company: *See*—
Clinton, Albert J., deceased; and O'Doherty, George O. P., 4,423,065, Cl. 424-304.000.
Wild, Gene M., 4,423,148, Cl. 435-76.000.

Elles, Richard J.; Ely, Razon; and Vilenski, Dan, to Kulicke and Soffa Industries, Inc. Method of making constant bonding wire tail lengths. 4,422,568, Cl. 228-111.000.

Elliott, Richard M.: *See*—
Johnson, Herbert; Elliott, Richard M.; Herdeg, Donald F.; and Peck, Alan M., 4,422,393, Cl. 112-121.500.

Ellis, Darwin V.; and Flaum, Charles, to Schlumberger Technology Corporation. Neutron logging method and apparatus for determining a formation characteristic free of environmental effects. 4,423,323, Cl. 250-264.000.

Ellison, Bruce; and DeCarteret, James A., to Ingersoll-Rand Company. Hole saw. 4,422,811, Cl. 408-204.000.

Ely, Razon: *See*—
Elles, Richard J.; Ely, Razon; and Vilenski, Dan, 4,422,568, Cl. 228-111.000.

Embru-Werke, Mantel & Cia.: *See*—
Rutsche, Wendolin; and Langenegger, Urs, 4,422,385, Cl. 108-153.000.

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Gater, Arnold C., 4,422,677, Cl. 292-139.000.

Emmanuelli, Yves A.: *See*—
Beck, Jean L.; Le Bars, Jean F.; Emmanuelli, Yves A.; and Bargues, Denis, 4,423,437, Cl. 358-113.000.

Endo, Hiroyuki: *See*—
Nakata, Tohru; Endo, Hiroyuki; Harada, Masatoshi; Hayasaka, Tadao; and Miyamoto, Osamu, 4,422,875, Cl. 75-243.000.

Endo, Yasushi: *See*—
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Enercon Industries Corporation: *See*—
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Energy Development Associates, Inc.: *See*—
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Engel, John F., to FMC Corporation. (+)-4-Substituted-2-indanols. 4,423,255, Cl. 568-808.000.

Engelman, Jeffery A.; and Sanford, James L., to International Business Machines Corporation. Switchable precision current source. 4,423,357, Cl. 315-307.000.

English, Paul R., to Medical Specialties, Inc. Emergency extrication appliance. 4,422,454, Cl. 128-134.000.

Enomoto, Fujio, to Olympus Optical Company Ltd. Photographing mode switching device for a camera. 4,422,742, Cl. 354-413.000.

Environmental Resources Management, Inc.: *See*—
Fender, Ronald G.; and MacGregor, Alan S., 4,422,943, Cl. 210-716.000.

Ersek, Robert A.: *See*—
Holman, Daniel G.; and Ersek, Robert A., 4,422,759, Cl. 356-243.000.

Eschenbacher, Robert C.: *See*—
Bordelon, Kent J.; Eschenbacher, Robert C.; and Bridendall, William H., 4,422,900, Cl. 159-48.100.

Escher Wyss Limited: *See*—
Christ, Alfred; Lehmann, Rolf; and Schlatter, Beat, 4,422,318, Cl. 72-200.000.

Eschrich, Gerhard: *See*—
Muller, Alfred; Eschrich, Gerhard; and Schreiber, Achim, 4,422,350, Cl. 74-753.000.

Esola, John L., to Rockwell International Corporation. Four chamber direct drive gas meter. 4,422,324, Cl. 73-266.000.

Espiritu Santo, Eugenio; and Baxter, Kenneth D., to Deere & Company. Snap-in draft sensor. 4,422,341, Cl. 73-862.640.

Essex Group, Inc.: *See*—
Goodrich, Ronald W., 4,423,399, Cl. 335-202.000.

ETA SA, Fabriques d'Ebauches: *See*—
Thoenig, Marcel, 4,422,775, Cl. 368-74.000.

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Danton, Jean-Louis, 4,423,102, Cl. 428-92.000.

Ethyl Corporation: *See*—
Jackisch, Philip F., 4,423,262, Cl. 570-193.000.
Myers, William H., 4,423,275, Cl. 585-645.000.
Rajan, Sundar J., 4,423,205, Cl. 528-371.000.
Zaiko, Edward J.; and Ranken, Paul F., 4,422,979, Cl. 260-465.00D.

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Evans, Lee L., to Intersil, Inc. Chopper-stabilized amplifier. 4,423,385, Cl. 330-9.000.

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Ewald, Jerome T., to Bendix Corporation, The. Closed-center hydraulic servo apparatus. 4,422,293, Cl. 60-547.100.

Ex-Cell-O Corporation: *See*—
Lisiecki, Robert E., 4,422,570, Cl. 229-17.00R.

Excelermatic Inc.: *See*—
Kraus, Charles E., 4,422,351, Cl. 74-798.000.
Exxon Research and Engineering Co.: *See*—
Dean, Anthony M., 4,423,017, Cl. 423-235.000.
Gould, Kenneth A.; Grenoble, Dane C.; Murrell, Lawrence L.; and Pieters, Wim J. M., 4,422,926, Cl. 208-86.000.
Ledford, Thomas H.; and Lerner, Howard, 4,423,025, Cl. 423-578.00R.
McGlothlin, Quentin T.; and O'Brien, Barry M., 4,427,928, Cl. 209-166.000.
Mitchell, Howard L., 4,422,975, Cl. 260-448.0AD.
Eymard, Pierre: *See*—
Chignac, Michel; Grain, Claude; Jammot, Fernand; Pigerol, Charles; Eymard, Pierre; and Ferrandes, Bernard, 4,423,071, Cl. 424-311.000.
Ezoe, Mitsuhiko, to Nissan Motor Co., Ltd. Combustion knock preventing apparatus for an internal combustion engine. 4,422,421, Cl. 123-424.000.
Ezzell, Bobby R.: *See*—
Carl, William P.; and Ezzell, Bobby R., 4,423,249, Cl. 568-655.000.
Fabian, Peter; Gundling, Manfred; and Rossler, Peter, to W. C. Heraeus GmbH. Electrolytic cell. 4,422,919, Cl. 204-270.000.
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Melby, Earl G.; Cocain, Harry W.; and Fabris, Hubert J., 4,423,193, Cl. 525-296.000.
Faccini, Ernest C., to United States of America, Navy. Four bar manifold. 4,422,471, Cl. 137-561.00A.
Fachinetti, Giuseppe, to Union Carbide Corporation. Process for the production of oxygen-containing organic products. 4,423,250, Cl. 568-678.000.
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Stenudd, Sven G. V.; and Stenudd, Lars-Gunnar M., 4,423,361, Cl. 318-135.000.
Fage, Etienne, to Societe ASTECH. Reverser for jet engine. 4,422,605, Cl. 244-110.00B.
Fahnler, Friedrich: *See*—
Grigo, Ulrich; Fahnler, Friedrich; and Binsack, Rudolf, 4,423,186, Cl. 525-66.000.
Fairchild Camera & Instrument Corp.: *See*—
Tickle, Andrew C., 4,423,491, Cl. 365-154.000.
Falkenbach, Gunther; Seuwen, Dieter; Schneider, Jurgen; and Kahlcke, Hartwig, to Braun Aktiengesellschaft. Kitchen appliance with interchangable attachments. 4,422,343, Cl. 74-16.000.
Falkenberg, Gabriel: *See*—
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Fandrich, Fred: *See*—
Fandrich, Helmut E.; and Fandrich, Fred, 4,422,284, Cl. 56-328.00R.
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Farge, Daniel; Roy, Pierre L.; Moutonnier, Claude; and Peyronel, Jean-Francois, to Rhone-Poulenc Industries. 3-Vinylcephalosporin derivatives. 4,423,214, Cl. 544-22.000.
Farid, Samir Y.: *See*—
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Farr, Glyn Phillip R., to Lucas Industries Limited. Vehicle braking systems. 4,422,693, Cl. 303-24.00A.
Farr, Glyn Phillip R., to Lucas Industries Limited. Anti-skid braking system for vehicles. 4,422,695, Cl. 303-115.000.
Fathom Oceanology Limited: *See*—
Hale, Neville E.; and Gardner, Kenneth, 4,422,801, Cl. 405-195.000.
Faust, Wilfried: *See*—
Riebel, Hans-Jochem; Eue, Ludwig; and Faust, Wilfried, 4,422,866, Cl. 71-92.000.
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Berezowski, Jaroslaw; and Feinman, Harvey M., 4,423,317, Cl. 235-458.000.
Feinstein, Paul L., to Varian Associates, Inc. On-column capillary gas chromatographic injector. 4,422,860, Cl. 55-67.000.
Feissel, M. Henri, to Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme). Method of testing a logic system and a logic system for putting the method into practice. 4,423,509, Cl. 371-25.000.
Feldman, Hugh V.: *See*—
Buckenham, Howard A.; Feldman, Hugh V.; Gotley, Paul; and Young, Richard, 4,423,487, Cl. 364-551.000.
Felleisen, Peter; Mayer, Dieter; Koester, Eberhard; Domas, Friedrich; and Deigner, Paul, to BASF Aktiengesellschaft. Magnetic recording disk. 4,423,454, Cl. 360-135.000.
Felten & Guilleaume Carlswerk Aktiengesellschaft: *See*—
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Felty, Lanny G.: *See*—
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Fender, Ronald G.; and MacGregor, Alan S., to Environmental Resources Management, Inc. Method for precipitation of heavy metal sulfides. 4,422,943, Cl. 210-716.000.
Fengler, Werner H. Portable solid fuel electric power plant for electrical powered vehicles. 4,423,332, Cl. 290-45.000.
Fenton, Jeff T., to Conoco Inc. Process for purifying acetals. 4,423,238, Cl. 549-368.000.
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Fine, Arthur D.: *See*—
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Finner, Marshall F.; and Singh, Shiw S., to Wisconsin Alumni Research Foundation. Apparatus for testing grains for resistance to damage. 4,422,319, Cl. 73-12.000.
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Stafford, George C., 4,423,324, Cl. 250-281.000.
Fisch, Nathaniel J., to United States of America, Energy. System and method for generating current by selective minority species heating. 4,423,001, Cl. 376-123.000.
Fischell, Robert E., to United States of America, Navy. Low susceptibility proof mass for a single axis drag compensation system. 4,422,330, Cl. 73-517.00R.
Fitch, Anthony R. L.: *See*—
Pentney, Harry; and Fitch, Anthony R. L., 4,422,478, Cl. 138-168.000.
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Flanagan, Allan L., to Foxboro Company, The. Industrial process indicating/recording apparatus using stepping motor drive. 4,423,412, Cl. 340-661.000.
Flaum, Charles: *See*—
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Fletcher, Leslie S. Novelty educational puzzle apparatus. 4,422,642, Cl. 273-157.00R.
Flock, John W.; Matson, Stephen L.; and Bollenbeck, Peter H., to General Electric Company. Process for recovery of solid thermoplastic resins from solutions thereof in organic solvents. 4,423,207, Cl. 528-499.000.
Flowtec AG: *See*—
Hafner, Peter, 4,422,337, Cl. 73-861.170.
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Engel, John F., 4,423,255, Cl. 568-808.000.
Henriksen, Arthur J.; Thiel, Klaus F.; and Peterson, Carl F., 4,422,390, Cl. 110-341.000.
Plummer, Ernest L.; and Seelye, David E., 4,423,234, Cl. 549-80.000.
Thurn, Carrol R., 4,422,625, Cl. 266-281.000.
Foley, Paul, to Celanese Corporation. Hydroesterification of 1-alkene. 4,422,977, Cl. 260-455.00R.
Fonov, Sergei D.: *See*—
Gribanov, Dmitry D.; Kulesh, Vladimir P.; Martynov, Apollinary K.; Orlov, Anatoly A.; Sidorov, Alexandr I.; Fonov, Sergei D.; and Stepanov, Arkady V., 4,422,737, Cl. 352-39.000.
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Holubka, Joseph W., 4,423,171, Cl. 523-454.000.
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Forquer, William F., to Security Shutter Corp. Support members and gear drive for shutter and awning devices. 4,422,493, Cl. 160-133.000.
Foss, Norman A., to Honeywell Inc. Multi-spectral Schottky barrier infrared radiation detection array. 4,423,325, Cl. 250-332.000.
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Fox, Richard W. Welding cable and equipment. 4,423,306, Cl. 219-137.900.
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Franklin, Lindsay J. Gas hydrates drilling procedure. 4,422,513, Cl. 175-17.000.
Franz, Gutmann; and Sieber, Peter, to Platson A/G Kunststoffwerke Hans Frei & Sohne. Warming jug. 4,422,442, Cl. 126-390.000.
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Freeman, Billy P.: *See*—
Miller, David L. W.; and Freeman, Billy P., 4,422,833, Cl. 417-183.000.
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Frommelt, Sylvan J., to Frommelt Industries, Inc. Dockboard seal. 4,422,199, Cl. 14-71.100.
Frommer, Joseph C. Photo-electric particle sensing system. 4,422,761, Cl. 356-338.000.
Fry, Frank R., to Hercules Incorporated. Asphalt compositions. 4,422,878, Cl. 106-219.000.
Fuchs, Rainer; Naumann, Klaus; Behrenz, Wolfgang; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating arthropods with perfluorobenzyl 2,2-dimethyl-3-vinyl-cyclopropane carboxylates. 4,423,066, Cl. 424-305.000.
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Gebert, Hans; Loffelhardt, Manfred; and Obernosterer, Gerhard, to Knecht Filterwerke GmbH. Connecting means for filter cartridges. 4,422,790, Cl. 403-11.000.
Geible, Harry F. Paint stirrer. 4,422,770, Cl. 366-248.000.
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Chafin, William J.; and Brown, Ben C., 4,422,494, Cl. 164-80.000.
Dearlove, Thomas J.; Gray, Richard K.; and Atkins, Richard P., 4,423,094, Cl. 427-386.000.
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Kopich, Leonard F., 4,422,690, Cl. 297-341.000.
Mowery, Kenneth D.; and Pechous, L. Joseph, 4,422,422, Cl. 123-425.000.
Murphy, Michael P.; Stack, Gary F.; Hoppenrath, James W.; and Taylor, John R., 4,423,309, Cl. 219-270.000.
Paravano, Reno R., 4,422,276, Cl. 52-511.000.
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Snellgrove, Richard A., 4,423,026, Cl. 423-636.000.
General Signal: *See*—
Huffman, Theron M., 4,422,290, Cl. 60-404.000.
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Bogdany, John, 4,423,103, Cl. 428-95.000.
Melby, Earl G.; Cocain, Harry W.; and Fabris, Hubert J., 4,423,193, Cl. 525-296.000.
George, Richard D.: *See*—
Kaltz, Milton C.; Chojnowski, Edward M.; Garascia, David C.; Bauer, Barney J.; and George, Richard D., 4,422,687, Cl. 296-221.000.
Gerard, Roger E. J., to Marconi Company Limited, The. Multisignal amplification. 4,423,386, Cl. 330-54.000.
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Hoezee, Doug, 4,422,372, Cl. 99-353.000.
Gerhart, Fritz; and Van Dorsselaer, Viviane, to Merrell Toraude et Compagnie. Fluorinated diaminopentene derivatives. 4,423,073, Cl. 424-314.000.
Gerwick, Ben C., Jr.; Price, Edward B.; and Taylor, Thomas P., to Mobil Oil Corporation. Gravity base of offshore production platform with ice-pentrating peripheral nose sections. 4,422,804, Cl. 405-210.000.
Geskin, Ernest S. Method of heating, melting, and coal coversion and apparatus for the same. 4,422,872, Cl. 75-51.000.
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Dettmers, Michael; Weirich, Walter; and Peters, Bernd, 4,422,807, Cl. 405-296.000.
Temme, Helmut; and Beckmann, Erwin, 4,422,542, Cl. 198-735.000.
Giard, Robert L. Masonry product. 4,422,269, Cl. 52-100.000.
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Burke, Peter G., 4,422,400, Cl. 114-73.000.
Gilb, Tyrell T., to Simpson Strong-Tie Company, Inc. Gusset metal ledger hanger. 4,422,792, Cl. 403-232.100.
Gillette Company, The: *See*—
Trotta, Robert A., 4,422,237, Cl. 30-85.000.
Gilmore, Merle L.: *See*—
Bailey, David F.; Gilmore, Merle L.; Ganucheau, Charles J., Jr.; and Clow, Gary W., 4,423,416, Cl. 340-825.520.
Gist-Brocades N.V.: *See*—
Akkerboom, Piet J.; and Oldenhof, Christophorus, 4,422,971, Cl. 260-245.20R.
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Davies, Glyndwr J., 4,423,093, Cl. 427-385.500.
Glaeser, George L. Transversely restrained, longitudinally flexible mount for a bearing for a spindle. 4,422,780, Cl. 384-215.000.
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Harcuba, Siegfried, 4,422,404, Cl. 118-315.000.
Global Marin, Inc.: *See*—
Wetmore, Sherman B., 4,422,803, Cl. 405-204.000.
Glumac, George. Electrode. 4,422,461, Cl. 128-798.000.
Goans, Kip B., to Baker Cac, Inc. Control line blow out preventer. 4,422,503, Cl. 166-53.000.
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Goedde, Gary L.; and Rice, Charles H., to Electric Power Research Institute, Inc. Non-linear resistor stack and its method of assembly. 4,423,404, Cl. 338-21.000.
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Golan, Dan. Embroidery hoop. 4,422,250, Cl. 38-102.200.
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Crescenzi, Emil J., Jr.; Wilser, Walter T.; Oglesbee, Richard W.; and Gold, Richard B., 4,423,388, Cl. 330-277.000.
Goldman, Robert N., to Light Signatures, Inc. Non-counterfeitable document system. 4,423,415, Cl. 340-825.340.
Goldschmidt, Katalin: *See*—
Korosi, Jeno; Lang, Tibor; Andrasi, Ferenc; Szekely, Jozsef; Hamori, Tamas; Balogh, Tibor; Ila, Lajos; Goldschmidt, Katalin; Sineger, Eleonora; and Moravcsik, Imre, 4,423,044, Cl. 424-244.000.
Gomes, John M.: *See*—
Baglin, Elizabeth G.; and Gomes, John M., 4,423,011, Cl. 423-22.000.
Goni Unzue, A. Javier: *See*—
De Burgos Garcia, Eduardo; Goni Unzue, A. Javier; Gutierrez Barranco, Juan M.; and Pajares Suarez, Juan A., 4,423,329, Cl. 250-374.000.
Gonser, Donald I., to Dentsply Research & Development Corporation. Vitrifiable adhesive process. 4,422,891, Cl. 156-89.000.
Goodin, Charles R.: *See*—
Roeger, Carl R.; Miller, William D.; and Goodin, Charles R., 4,422,582, Cl. 241-82.500.
Goodman, Phillip M.: *See*—
Charney, Joseph C.; Goodman, Phillip M.; and Morgan, Robert H., 4,422,789, Cl. 401-218.000.
Goodrich, Judson E.: *See*—
Graf, Peter E.; and Goodrich, Judson E., 4,423,088, Cl. 427-138.000.
Goodrich, Ronald W., to Essex Group, Inc. Electromagnetic contactor. 4,423,399, Cl. 335-202.000.
Gordin, Myron K.; Drost, James L.; and Mydosh, Bryan L., to Mycro-Group Company. Mobile lighting fixture, method and boom. 4,423,471, Cl. 362-96.000.
Gordon, K. Scott: *See*—
Williams, Russell H.; Garner, Peter; and Gordon, K. Scott, 4,422,715, Cl. 350-96.200.
Gosselin, Robert G.: *See*—
Wallace, Edward M.; Gosselin, Robert G.; and Labarre, Ernest D., 4,422,240, Cl. 30-254.000.
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Bergsand, Arne; and Marsland, Henryk, 4,422,210, Cl. 15-302.000.
Gotley, Paul: *See*—
Buckenham, Howard A.; Feldman, Hugh V.; Gotley, Paul; and Young, Richard, 4,423,487, Cl. 364-551.000.
Gotou, Kanzen, to Hitachi, Ltd. Transaction processing system. 4,423,318, Cl. 235-379.000.
Gottwald, Johannes F., to Xerox Corporation. Motor drive. 4,423,366, Cl. 318-696.000.
Gould, Kenneth A.; Grenoble, Dane C.; Murrell, Lawrence L.; and Pieters, Wim J. M., to Exxon Research and Engineering Co. Separating basic asphaltenes using Bronsted acid transition metal oxide acid catalysts. 4,422,926, Cl. 208-86.000.
Goupy, Marcel, to Regie Nationale des Usines Renault. Energy absorbing curved sections. 4,422,680, Cl. 293-122.000.
Grace, Mark T.; Naiman, Michael I.; and French, Eddie C., to Petrolite Corporation. Corrosion inhibition of halocarbon systems. 4,422,953, Cl. 252-392.000.
Graf, Peter E.; and Goodrich, Judson E., to Chevron Research Company. Method for depositing asphalt. 4,423,088, Cl. 427-138.000.
Gragoe, Edward J., Jr.: *See*—
Rooney, Clarence S.; Williams, Haydn W. R.; Gragoe, Edward J., Jr.; and Patchett, Arthur A., 4,423,063, Cl. 424-278.000.
Graham, Marvin M.; and Katchka, Jay R., to Robertshaw Controls Company. Snap acting thermostatic fluid valve and electrical switch coupled thereto. 4,422,844, Cl. 431-72.000.
Grain, Claude: *See*—
Chignac, Michel; Grain, Claude; Jammot, Fernand; Pigerol, Charles; Eymard, Pierre; and Ferrandes, Bernard, 4,423,071, Cl. 424-311.000.
Grandics, Peter. Affinity gel-adsorbent. 4,423,208, Cl. 536-5.000.

Grant, Barbara D.; Hilden, Magdalena M.; Jones, Carol R.; and Sincerbox, Glenn T., to International Business Machines. Method for making high efficiency holograms. 4,422,713, Cl. 350-3.610.

Grasselli, R. K.; Burrington, J. D.; Pesa, F. A.; and Hardman, H. F., to Standard Oil Company. Acrylic dimerization using supported catalysts. 4,422,980, Cl. 260-465.80D.

Graviner Limited: *See*—
Ball, David N., 4,423,326, Cl. 250-339.000.

Gray, Richard K.: *See*—
Dearlove, Thomas J.; Gray, Richard K.; and Atkins, Richard P., 4,423,094, Cl. 427-386.000.

Gray, Thomas J., to Olin Corporation. Raney alloy methanation catalyst. 4,422,961, Cl. 502-301.000.

Green, Andrew: *See*—
Bardo, Charles J.; and Green, Andrew, 4,422,983, Cl. 261-24.000.

Green Cross Corporation, The: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,423,061, Cl. 424-274.000.

Green, Merlin G., to Deere & Company. Two-way control lever rotatable in cab wall for sound sealing. 4,422,345, Cl. 74-471.0XY.

Green, William L.; Calkins, Dennis E.; Harrison, Gary E.; and Wilkins, Jesse R., to McDermott Incorporated. Method for installing submarine pipelines using a marine railway system. 4,422,799, Cl. 405-158.000.

Greenbaum, Sheldon. Wall expansion device with anchoring socket. 4,422,813, Cl. 411-38.000.

Greenman, Norman L.; Berry, Richard C.; Tracy, Douglas H.; Arnio, Bruce M.; Lunt, Michael S.; and Otto, Jeffrey B., to Rogers Corporation. Fiber reinforced rubber gasket material. 4,423,109, Cl. 428-288.000.

Greig, John H., to Loral Corp. Cued adaptive canceller. 4,423,505, Cl. 370-32.000.

Greiler, Wolfgang, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. Combined high pressure discharge lamp and reflector assembly. 4,423,348, Cl. 313-113.000.

Grenoble, Dane C.: *See*—
Gould, Kenneth A.; Grenoble, Dane C.; Murrell, Lawrence L.; and Pieters, Wim J. M., 4,422,926, Cl. 208-86.000.

Greving, Bernd: *See*—
Obenaus, Fritz; Greving, Bernd; Balke, Heinrich; and Scholz, Bernhard, 4,423,271, Cl. 585-639.000.

Gribanov, Dmitry D.; Kulesh, Vladimir P.; Martynov, Apollinary K.; Orlov, Anatoly A.; Sidorov, Alexandr I.; Fonov, Sergei D.; and Stepanov, Arkady V. Device for obtaining topographic picture of surface of rotating object. 4,422,737, Cl. 352-39.000.

Griffin, Auburn K., Jr.: *See*—
Ramsey, James E., Jr.; and Griffin, Auburn K., Jr., 4,423,375, Cl. 324-137.000.

Griffith Laboratories, Limited, The: *See*—
Darley, Kenneth S.; Dyson, David V.; and Grimshaw, David J., 4,423,078, Cl. 426-20.000.

Griffiths, Edward E. Remote valve operating system. 4,422,619, Cl. 251-130.000.

Grigo, Ulrich; Fahnler, Friedrich; and Binsack, Rudolf, to Bayer Aktiengesellschaft. Impact resistant polyamide moulding compositions. 4,423,186, Cl. 525-66.000.

Grigo, Ulrich: *See*—
Arlt, Klaus-Peter; Binsack, Rudolf; Grigo, Ulrich; and Neuray, Dieter, 4,423,196, Cl. 526-72.000.

Grimshaw, David J.: *See*—
Darley, Kenneth S.; Dyson, David V.; and Grimshaw, David J., 4,423,078, Cl. 426-20.000.

Groebner, Bonnie J. Educational toy and container. 4,422,850, Cl. 434-98.000.

Groenewegen, Johannes B.; and Meginniss, Stephen M., III, to Sundstrand Data Control, Inc. Extreme temperature tape recorder drive belt. 4,422,598, Cl. 242-192.000.

Groginsky, Charles M.: *See*—
Orlowski, Ronald C.; Groginsky, Charles M.; and Seyler, Jay K., 4,422,967, Cl. 260-112.50T.

Grosch, Wayne A. Pump for a reverse circulation rotary drilling rig. 4,422,514, Cl. 175-213.000.

Grosse Webereimaschinen GmbH: *See*—
Geirhos, Werner; and Dietmayer, Josef, 4,422,480, Cl. 139-66.00R.

Grosskopf, Peter V. Cold storage element, mounting assembly and air control slats therefor. 4,422,305, Cl. 62-430.000.

Grosvenor, Ronald L.; and Fox, Michael, to IMI Marston Limited. Fuel tank com,onent. 4,422,561, Cl. 220-461.000.

Groves, Kenneth W.; and Lea, John D., to Sperry Corporation. Beam steerable sonar array. 4,423,494, Cl. 367-123.000.

Grumman Aerospace Corporation: *See*—
Kirsch, Jerome; and Markow, Edward, 4,422,820, Cl. 415-4.000.

Grunig, Kurt, to Jos. Habegger, AG. Hollow rotary clamping apparatus. 4,422,654, Cl. 279-4.000.

Guagliardo, Matthew, to Inmont. Dimer acid based polyurethane coating compositions. 4,423,179, Cl. 524-539.000.

Guest Industries, Inc.: *See*—
Guest, William H., 4,422,819, Cl. 414-724.000.

Guest, William H., to Guest Industries, Inc. Fold-away fork lift for loaders. 4,422,819, Cl. 414-724.000.

Gugel, Georg; and Kaiser, Theodor, to INA Walzlager Schaeffler KG. Rotary roller bearing connection with a free center. 4,422,697, Cl. 308-175.000.

Guild, John R., to Eastman Kodak Company. Resist developer with ammonium or phosphonium compound and method of use to develop o-quinone diazide and novolac resist. 4,423,138, Cl. 430-326.000.

Gundling, Manfred: *See*—
Fabian, Peter; Gundling, Manfred; and Rossler, Peter, 4,422,919, Cl. 204-270.000.

Gurol, I. Macit; and Bang, Gary M., to John Fluke Mfg. Co., Inc. Touch sensitive transparent switch array. 4,423,299, Cl. 210-159.00B.

Gurr, George P., to Cyborex Laboratories, Inc. Energy controller and method utilizing bi-metal elements to adjust thermostat setting and to shed and restore controlled loads in prioritized order. 4,423,335, Cl. 307-31.000.

Gurr, George P., to Sangamo Weston, Inc. Rectifier controller. 4,423,477, Cl. 363-54.000.

Gusack, James A.; Bird, David O.; Thomm, Ernest C.; and Reitz, William A., to Badische Corporation. Apparatus for interlacing multifilament yarn. 4,422,224, Cl. 28-272.000.

Gustavson, Roy, to Flakt Aktiebolag. Method to recover heat from treatment premises and apparatus for achieving the method. 4,422,370, Cl. 98-11.5SB.

Gutcho, Sidney; and Mansbach, Lillian, to Becton Dickinson and Company. Simultaneous radioassay of folate and vitamin B12. 4,423,154, Cl. 436-505.000.

Guthrie, George L. Tear bar for a printer. 4,422,787, Cl. 400-621.000.

Gutierrez Barranco, Juan M.: *See*—
De Burgos Garcia, Eduardo; Goni Unzue, A. Javier; Gutierrez Barranco, Juan M.; and Pajares Suarez, Juan A., 4,423,329, Cl. 250-374.000.

Guyon, James G.: *See*—
Brady, Robert T.; and Guyon, James G., 4,422,387, Cl. 110-173.00R.

Haaf, William R., to General Electric Company. Compositions of a polyphenylene ether resin, low molecular weight polystyrene and a block copolymer. 4,423,189, Cl. 525-92.000.

Haas, Peter: *See*—
Lobach, Wilfried; Haas, Peter; Kolb, Gunter; Sackmann, Guter; and Probst, Joachim, 4,423,194, Cl. 525-327.600.

Haavik, Harold K., to Nash Engineering Company, The. Liquid ring pump with vanes in liquid ring. 4,422,832, Cl. 417-68.000.

Habdas, Edward P.; Aaron, Jon D.; and Whitten, Timothy H., to UOP Inc. Method for producing high temperature electrical connection. 4,422,233, Cl. 29-570.000.

Hackett, Adeline J.: *See*—
Stampfer, Martha R.; Smith, Helene S.; and Hackett, Adeline J., 4,423,145, Cl. 435-32.000.

Haddad, James H.: *See*—
Daviduk, Nicholas; and Haddad, James H., 4,423,274, Cl. 585-640.000.

Haendle, Joerg; and Maass, Wolfgang, to Siemens Aktiengesellschaft. Diagnostic X-ray installation comprising a control loop for the exposure control. 4,423,521, Cl. 378-108.000.

Hafner, Peter, to Flowtec AG. Method of compensating the interference DC voltages in the electrode circuit in magnetic-conductive flow measurement. 4,422,337, Cl. 73-861.170.

Haga, Tomoyuki, to Shiseido Company, Ltd. Nail file and method for producing the same. 4,422,465, Cl. 132-76.400.

Hahn, Robert E.; Jones, Thomas R.; and Berning, Peter H., to Optical Coating Laboratory, Inc. Optical article having a conductive antireflection coating. 4,422,721, Cl. 350-164.000.

Hahnle, Reinhard; Schneider, Manfred; Schuster, Claus; and Schickfluss, Rudolf, to Hoechst Aktiengesellschaft. Transfer printing support, process for the manufacture thereof, with blue azo dye:dicyano-nitro-phenyl-azo aniline. 4,422,854, Cl. 8-471.000.

Haigh Engineering Co. Ltd., The: *See*—
Shepherd, Nigel R. C.; and Preece, Graham M., 4,422,580, Cl. 241-46.110.

Haines, Robert L. Fixed cloth speed inspection machine. 4,422,223, Cl. 26-70.000.

Hale, Neville E.; and Gardner, Kenneth, to Fathom Oceanology Limited. Buoyancy system for large scale underwater risers. 4,422,801, Cl. 405-195.000.

Hall, Charles M.; and Wright, John B., to Upjohn Company, The. Benzothiazole derivatives. 4,423,223, Cl. 548-163.000.

Hall Company, The: *See*—
Walser, Richard J.; and Wyant, Gary M., 4,423,294, Cl. 200-5.00A.

Halliburton Company: *See*—
Beck, Harold K., 4,422,506, Cl. 166-324.000.

Hamabe, Takafumi, to Matsushita Electric Works, Ltd. Massaging apparatus. 4,422,449, Cl. 128-44.000.

Hamabe, Takafumi: *See*—
Sugai, Haruo; Hamabe, Takafumi; Yamamura, Yukio; Otuka, Shinpei; and Moriwaki, Hiroshi, 4,422,448, Cl. 128-44.000.

Hamacher, Martin. Mine lamp. 4,423,474, Cl. 362-223.000.

Hamada, Hideo: *See*—
Suga, Masaaki; Morimoto, Yoshiro; Hamada, Hideo; Futagi, Masaaki; and Suzuki, Tadashi, 4,422,353, Cl. 74-858.000.

Hamaekers, Arno; Ticks, Gerd-Heinz; and Rudolf, Hans-Joachim, to Carl Freudenberg, Firma. Hydraulic bearing support. 4,422,779, Cl. 384-99.000.

Hambrecht, Juergen: *See*—
Brandstetter, Franz; Echte, Adolf; Hambrecht, Juergen; Illers, Karl H.; and Priebe, Edmund, 4,423,187, Cl. 525-68.000.

Hamilton, Harold J., to Censtor Corporation. Magnetic head and multitrack transducer for perpendicular recording and method for fabricating. 4,423,450, Cl. 360-111.000.

Hamilton, William H. Irrigation control system. 4,423,484, Cl. 364-420.000.

Hammann, Ingeborg: *See*—
Fuchs, Rainer; Naumann, Klaus; Behrenz, Wolfgang; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,423,066, Cl. 424-305.000.
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,423,058, Cl. 424-273.00P.

Hammerschlag, Peter G. Bag-positioned hinged seals for air cushion vehicles. 4,422,517, Cl. 180-127.000.

Hammond, Charles W.: *See*—
Nelson, John E.; Hammond, Charles W.; Huston, Rolland E.; and Helton, Michael R., 4,422,882, Cl. 134-22.180.

Hammond, Dean C., Jr.; and Vickers, Paul T., to General Motors Corporation. Method of making wall-flow monolith filter. 4,423,090, Cl. 427-181.000.

Hammond, Michael J.; and Kilic, Sidika, to Energy Development Associates, Inc. Metal halogen battery construction with combustion arrester to prevent self propagation of hydrogen-halogen reactions. 4,423,121, Cl. 429-19.000.

Hammonds, James C.: *See*—
Cordani, Eugene J.; Hammonds, James C.; and Vorwerk, Frederick E., 4,422,532, Cl. 188-47.000.

Hamori, Tamas: *See*—
Korosi, Jeno; Lang, Tibor; Andrasi, Ferene; Szekely, Jozsef; Hamori, Tamas; Balogh, Tibor; Ila, Lajos; Goldschmidt, Katalin; Sineger, Eleonora; and Moravcsik, Imre, 4,423,044, Cl. 424-244.000.

Hamunen, Antti, to OY Kaukas AB. Process for the purification of β-sitosterol isolated from the unsaponifiables in crude soap from the sulphate cellulose process. 4,422,974, Cl. 260-397.250.

Hanacek, William A.: *See*—
Armstrong, Errol C.; Hanacek, William A.; Hermann, Paul F.; and Kennedy, Thorburn S., 4,422,990, Cl. 264-45.300.

Hannah, William M. Kicking apparatus. 4,422,249, Cl. 36-133.000.

Hansen, Boyd K.: *See*—
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Hansen, Charles M., Jr., to Bendix Corporation, The. Unbalanced current detector for three phase electrical system. 4,423,374, Cl. 324-86.000.

Hanson, Merlin L.; Swenson, Robert E.; and Talarczyk, Anthony R., to Sperry Corporation. Cache/disk subsystem with acquire write command. 4,423,479, Cl. 364-200.000.

Haoli, Choh, to University of California, The Regents of the. β-Endorphin analogs. 4,422,968, Cl. 260-112.50E.

Hara, Hajime: *See*—
Miyazaki, Kazuo; Hara, Hajime; Teramoto, Kojiro; Horii, Hideo; Oshimi, Humiaki; and Araki, Yoshihiko, 4,423,239, Cl. 549-541.000.
Otsuki, Yutaka; Araki, Yoshihiko; Omika, Hiroyoshi; Hara, Hajime; and Aoyama, Kazuho, 4,423,172, Cl. 523-454.000.

Harada, Masatoshi: *See*—
Nakata, Tohru; Endo, Hiroyuki; Harada, Masatoshi; Hayasaka, Tadao; and Miyamoto, Osamu, 4,422,875, Cl. 75-243.000.

Harao, Norio: *See*—
Sugimori, Fumio; Nishino, Chikae; and Harao, Norio, 4,423,351, Cl. 313-523.000.

Harashima, Kiyoshi: *See*—
Naito, Han-Ichiro; Yamaguchi, Tsuneo; and Harashima, Kiyoshi, 4,422,816, Cl. 414-331.000.

Harcuba, Siegfried, to Glasfabriken-Ausruestergesellschaft m.b.H. Apparatus for coating of glass. 4,422,404, Cl. 118-315.000.

Hardesty, Donald E.; and McCullough, Glenn R., to Shell Oil Company. Process for feeding slurry-pressurized and solvent-dewatered coal into a pressurized zone. 4,422,246, Cl. 34-9.000.

Harding, Geoffrey, to U.S. Philips Corporation. Device for the imaging of body layers by means of monoenergic radiation. 4,423,522, Cl. 378-87.000.

Hardman, H. F.: *See*—
Grasselli, R. K.; Burrington, J. D.; Pesa, F. A.; and Hardman, H. F., 4,422,980, Cl. 260-465.80D.

Hardman, Harley F.: *See*—
Velenyi, Louis J.; Hardman, Harley F.; and Pesa, Fred A., 4,423,023, Cl. 423-376.000.

Hardy, George W.: *See*—
Wilkinson, Samuel; Hardy, George W.; and Wrigglesworth, Roger, 4,423,242, Cl. 560-41.000.

Hargreaves, Rodney B.: *See*—
Brown, David; Dowell, Robert I.; Hargreaves, Rodney B.; and Main, Brian, 4,423,045, Cl. 424-246.000.

Hargrove, Arthur K.; and Brown, Ronald L., to Sperry Corporation. FIFO Register with independent clocking means. 4,423,482, Cl. 364-200.000.

Harigaya, Isao: *See*—
Masunaga, Makoto; Kinoshita, Takao; Sakane, Toshio; Tsunekawa, Tokuichi; Hosoe, Kazuya; Amikura, Takashi; and Harigaya, Isao, 4,422,741, Cl. 354-403.000.

Harlan Material Handling Corporation: *See*—
Kaplan, James H.; and Lissauer, Joel S., 4,422,656, Cl. 280-3.000.

Harpell, Gary A.: *See*—
Birkmaier, Albert A.; Harpell, Gary A.; Kurtz, Bruce E.; Patel, Gordhanbhai N.; Poncha, Rustom P.; Skovrinski, Adam L.; and Lesco, James M., 4,422,907, Cl. 204-38.00B.

Harper, Lee R.; Obetz, Judith E.; and Steinmetz, William H., to Du Pont de Nemours, E. I., and Company. Water-borne coating composition made from epoxy resin, first polymeric acid, tertiary amine and second polymeric acid. 4,423,165, Cl. 523-409.000.

Harris Corporation: *See*—
Campbell, David K., 4,423,488, Cl. 364-724.000.
Trentman, John L., 4,422,630, Cl. 270-53.000.
Waters, George W., 4,423,390, Cl. 331-4.000.

Harris Graphics Corporation: *See*—
Werkheiser, James S., 4,422,549, Cl. 206-386.000.

Harris, Steven D.; and Wolfe, Joseph I., to Eaton Corporation. Method of making an electro-optical display. 4,422,726, Cl. 350-331.00R.

Harris, William S., to Roly-Door Sales Company of Rochester, Inc. Safety gate assembly. 4,422,264, Cl. 49-121.000.

Harrison, Gary E.: *See*—
Green, William L.; Calkins, Dennis E.; Harrison, Gary E.; and Wilkins, Jesse R., 4,422,799, Cl. 405-158.000.

Harsco Corporation: *See*—
Gallis, Anthony J., 4,422,617, Cl. 249-19.000.

Harshaw Chemical Company, The: *See*—
Little, Frank, 4,422,774, Cl. 366-347.000.
Little, Frank, 4,422,817, Cl. 414-421.000.

Hart, Jimmie L.: *See*—
Arzoumanian, Aram S.; Hieber, Heinz W.; Nojiri, Howard H.; and Hart, Jimmie L., 4,422,784, Cl. 400-144.200.

Hartmann, Albert: *See*—
Baschang, Gerhard; Hartmann, Albert; Wacker, Oskar; and Tarcsay, Lajos, 4,423,038, Cl. 424-177.000.

Hartmann, Armin: *See*—
Hums, Dieter; Hartmann, Armin; Lippe, Klaus F.; and Wetzig, Werner, 4,422,989, Cl. 264-42.000.

Harvey Hubbell Incorporated: *See*—
Klein, L. E., 4,422,472, Cl. 137-614.060.

Harvey, Roy L.: *See*—
Galvin, Aaron A.; and Harvey, Roy L., 4,423,410, Cl. 340-525.000.

Harville, Paul R.: *See*—
Becker, Edward W.; Harville, Paul R.; and MacLeod, Glen E., 4,422,235, Cl. 29-749.000.

Hasegawa, Akira; Shimizu, Ippei; Kaneko Toshio; and Miyake, Sumio, to Jujo Paper Co., Ltd. Color developing sheet for pressure-sensitive recording sheet. 4,422,670, Cl. 282-27.500.

Hasegawa, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Movable magnetic head block assembly for a double sided flexible disk storage device. 4,423,449, Cl. 360-106.000.

Hasegawa, Yoji: *See*—
Dozono, Kichihiko; and Hasegawa, Yoji, 4,422,431, Cl. 123-568.000.

Hashimoto, Koosuke, to Mitsubishi Denki Kabushiki Kaisha. Electric motor. 4,423,359, Cl. 318-6.000.

Hastie, William F.: *See*—
Watt, Robert H.; Ladd, Richard H.; and Wright, Walter S., deceased, 4,422,301, Cl. 62-54.000.

Hasuo, Shinya; and Suzuki, Hideo, to Fujitsu Limited. Superconductive logic device. 4,423,430, Cl. 357-5.000.

Hatanaka, Masahiro: *See*—
Miyazaki, Toshikiyo; Miura, Ushio; and Hatanaka, Masahiro, 4,423,352, Cl. 313-584.000.

Hatanaka, Misao, to Kajima Kensetsu Kabushiki Kaisha; and Nippon Sangyo Kikai Kabushiki Kaisha. Apparatus for treating waste water. 4,422,930, Cl. 210-150.000.

Hattori, Shinichiro, to Olympus Optical Co., Ltd. Safety device for medical treatment system. 4,422,457, Cl. 128-303.100.

Haven, Richard E.; and Suh, Nam P., to Massachusetts Institute of Technology. High frequency electric field curing of polymeric composites. 4,423,191, Cl. 525-169.000.

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Wittman, Robert H.; Adkins, David E.; and Haws, Ronnie E., 4,422,477, Cl. 138-89.000.

Hayakawa, Kiyoshi: *See*—
Fukawa, Isaburo; Satake, Kunio; Yamada, Tsuyoshi; Hayakawa, Kiyoshi; and Sato, Yasushi, 4,423,190, Cl. 525-98.000.

Hayakawa, Yohichi: *See*—
Matsumoto, Gohichi; and Hayakawa, Yohichi, 4,422,349, Cl. 74-665.0GE.

Hayama, Masashi: *See*—
Saguchi, Hiroto; Hayama, Masashi; and Sakai, Keitaro, 4,423,114, Cl. 428-403.000.

Hayasaka, Tadao: *See*—
Nakata, Tohru; Endo, Hiroyuki; Harada, Masatoshi; Hayasaka, Tadao; and Miyamoto, Osamu, 4,422,875, Cl. 75-243.000.

Hayashi, Masahiro: *See*—
Suzuki, Yukio; Hayashi, Masahiro; and Takuma, Kenzi, 4,422,978, Cl. 260-465.00D.

Hayashigawa, Lawrence; and McFadden, Bertram W., to United States of America, Navy. isometric grip bending beam control. 4,422,851, Cl. 434-45.000.

Hayes, Harry; and Ahmed, Munir A., to Colgate-Palmolive Company. Flavored aqueous oral composition. 4,423,030, Cl. 424-58.000.

Hayfield, Peter C. S., to IMI Marston Limited. Electrode material, electrode and electrochemical cell. 4,422,917, Cl. 204-196.000.

Haynes, Taylor H. Medical suturing device. 4,422,567, Cl. 227-19.000.

Hazen Research Incorporated: *See*—
Reynolds, James E.; and Lombardo, Nicholas J., 4,423,012, Cl. 423-49.000.

Heady, Robert E., to CPC International Inc. Preparation of high fructose syrups from sucrose. 4,423,150, Cl. 435-193.000.

Heath Company: *See*—
Krenz, Horst M., 4,422,700, Cl. 339-14.00R.

Hedrick, Virginia L. Apparatus for quilting. 4,422,251, Cl. 38-102.200.
Heiber, Sonia J.: *See*—
Mueller, Karl F.; and Heiber, Sonia J., 4,423,099, Cl. 428-35.000.
Hein, Paul R.: *See*—
Tsao, Jung-Hsien; and Hein, Paul R., 4,422,914, Cl. 204-159.190.
Heinemann, Ulrich: *See*—
Lantzsch, Reinhard; Ditgens, Klaus; Heinemann, Ulrich; Thomas, Rudolf; and Weber, Erhard, 4,423,225, Cl. 548-373.000.
Helmac Products Corporation: *See*—
McKay, Nicholas D., 4,422,201, Cl. 15-104.00A.
Helton, Charles J., III: *See*—
Costello, William D.; Helton, Charles J., III; and Frank, Martin B., 4,422,660, Cl. 280-242.0WC.
Helton, Michael R.: *See*—
Nelson, John E.; Hammond, Charles W.; Huston, Rolland E.; and Helton, Michael R., 4,422,882, Cl. 134-22.180.
Hendriks, Ivo G. M.: *See*—
Liekens, J. Alfons F.; and Hendriks, Ivo G. M., 4,422,215, Cl. 17-1.00R.
Henkel Corporation: *See*—
Peerman, Dwight E.; and Rogier, Edgar R., 4,423,162, Cl. 521-164.000.
Henkel KGaA: *See*—
Diekotter, Friedrich W., 4,422,946, Cl. 210-777.000.
Henriksen, Arthur J.; Thiel, Klaus F.; and Peterson, Carl F., to FMC Corporation. Process and apparatus for collection of gases and particulates in a furnace feed system. 4,422,390, Cl. 110-341.000.
Henz, Robert W., Sr.: *See*—
Hull, Harvey C.; and Henz, Robert W., Sr., 4,422,358, Cl. 83-356.300.
Hercules Incorporated: *See*—
Fry, Frank R., 4,422,878, Cl. 106-219.000.
Herdeg, Donald F.: *See*—
Johnson, Herbert; Elliott, Richard M.; Herdeg, Donald F.; and Peck, Alan M., 4,422,393, Cl. 112-121.500.
Hermann, Paul F.: *See*—
Armstrong, Errol C.; Hanacek, William A.; Hermann, Paul F.; and Kennedy, Thorburn S., 4,422,990, Cl. 264-45.300.
Herod, James V.; and Neal, Charles H. Portable multiple use exerciser. 4,422,635, Cl. 272-96.000.
Herz, Arthur H., to Eastman Kodak Company. Silver halide emulsions containing aromatic latent image stabilizing compounds. 4,423,140, Cl. 430-445.000.
Hesston Corporation: *See*—
Gaeddert, Melvin V., 4,422,373, Cl. 100-88.000.
Hewlett-Packard Company: *See*—
Duc, Laurent; Boosen, Karl-Josef; and Marrel, Jean-Francois, 4,423,217, Cl. 544-267.000.
Hibi, Hazuo: *See*—
Shiozaki, Keniti; and Hibi, Hazuo, 4,423,508, Cl. 371-16.000.
Hicks, Darrell D., to Celanese Corporation. Co-reactive urethane surfactants and stable aqueous epoxy dispersions. 4,423,201, Cl. 528-76.000.
Hieber, Heinz W.: *See*—
Arzoumanian, Aram S.; Hieber, Heinz W.; Nojiri, Howard H.; and Hart, Jimmie L., 4,422,784, Cl. 400-144.200.
Higley, David P.: *See*—
Dowling, Robin M.; and Higley, David P., 4,423,267, Cl. 585-531.000.
Higuchi, Takeshi; Yoshikawa, Kazuo; and Buto, Hideo, to Fuji Photo Optical Co., Ltd. Color separation optical system for color television camera. 4,422,722, Cl. 350-173.000.
Hilden, Magdalena M.: *See*—
Grant, Barbara D.; Hilden, Magdalena M.; Jones, Carol R.; and Sincerbox, Glenn T., 4,422,713, Cl. 350-3.610.
Hilfman, Lee: *See*—
Lawson, Randy J.; Johnson, Russell W.; and Hilfman, Lee, 4,422,959, Cl. 502-247.000.
Hill, Michael L.: *See*—
Class, Walter H.; Hurwitt, Steven D.; Hill, Michael L.; and Hutt, Marvin K., 4,422,896, Cl. 156-643.000.
Hilliard, Steven F., to Lam, Roger C., a part interest. Wheeled carrier. 4,422,658, Cl. 280-47.400.
Hills, Blair H.: *See*—
Cousino, James L.; Nalewick, James A.; and Hills, Blair H., 4,422,940, Cl. 210-631.000.
Himmele, Walter: *See*—
Becker, Rainer; Jahn, Dieter; Rohr, Wolfgang; Himmele, Walter; Siegel, Hardo; and Wuerzer, Bruno, 4,422,864, Cl. 71-88.000.
Hinnant, William M. Boat transportation and launching means. 4,422,665, Cl. 280-414.200.
Hinnenkamp, James A.; and Walatka, Vernon V., Jr., to National Distillers and Chemical Corporation. Crystalline metal silicate compositions. 4,423,020, Cl. 423-277.000.
Hintsch, Otto, to Sulzer Brothers Limited. Guide tooth for a weaving machine. 4,422,482, Cl. 139-188.00R.
Hirano, Yasutaka: *See*—
Ohtomi, Sadayuki; Hirano, Yasutaka; Tangiku, Iturou; and Kondou, Tamaiti, 4,422,531, Cl. 187-20.000.
Hirasawa, Kunio: *See*—
Tsukushi, Masanori; Ohshita, Youichi; Hirasawa, Kunio; and Takahashi, Takeshi, 4,423,298, Cl. 200-144.0AP.
Hirosaki, Botaro, to Nippon Electric Co., Ltd. Timing recovery circuit. 4,423,518, Cl. 375-20.000.
Hirose, Masahiko; and Nishida, Katsutoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for treating powdery materials utilizing microwave plasma. 4,423,303, Cl. 219-121.00P.
Hirschberg, Eugene H.: *See*—
Bertolacini, Ralph J.; Hirschberg, Eugene H.; and Modica, Frank S., 4,423,019, Cl. 423-244.000.
Hirschey, Dareld A. Catalytic firebox. 4,422,437, Cl. 126-77.000.
Hitachi Koki Company, Limited: *See*—
Nakazawa, Yuki, 4,423,346, Cl. 310-68.00E.
Hitachi, Ltd.: *See*—
Goton, Kanzen, 4,423,318, Cl. 235-379.000.
Imaizumi, Ichiro; Ochi, Shikayuki; Kimura, Masatoshi; Yoshimura, Masayoshi; Yamaguchi, Takashi; and Koda, Toyomasa, 4,423,433, Cl. 357-51.000.
Kimura, Hiroyuki; Ohashi, Shin-ichi; and Nishimura, Keizo, 4,423,498, Cl. 369-47.000.
Koizumi, Mitsuyoshi; Akiyama, Nobuyuki; and Oshima, Yoshimasa, 4,423,331, Cl. 250-572.000.
Miyake, Kiyoshi; and Miyata, Naoyuki, 4,423,403, Cl. 338-15.000.
Nishida, Hiroshi; Takahashi, Tuyoshi; Shiono, Toshio; and Ohtsuka, Kiyomitsu, 4,423,447, Cl. 360-106.000.
Shiozaki, Keniti; and Hibi, Hazuo, 4,423,508, Cl. 371-16.000.
Takahashi, Tuyoshi; Nishida, Hiroshi; and Shiono, Toshio, 4,423,446, Cl. 360-106.000.
Tsukushi, Masanori; Ohshita, Youichi; Hirasawa, Kunio; and Takahashi, Takeshi, 4,423,298, Cl. 200-144.0AP.
Hitachi Powdered Metals Co., Ltd.: *See*—
Nakata, Tohru; Endo, Hiroyuki; Harada, Masatoshi; Hayasaka, Tadao; and Miyamoto, Osamu, 4,422,875, Cl. 75-243.000.
Hobart Corporation: *See*—
Berner, George J., 4,423,486, Cl. 364-466.000.
Roeger, Carl R.; Miller, William D.; and Goodin, Charles R., 4,422,582, Cl. 241-82.500.
Hobo, Nobuhito: *See*—
Sami, Hiroshi; Ito, Osamu; Kawai, Shizuo; Hobo, Nobuhito; Nishio, Teruo; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,423,485, Cl. 364-431.050.
Hochtemperatur-Reaktorbau GmbH: *See*—
Kolodzey, Jurgen; Schoening, Josef; Schwiers, Hans-Georg; and Stracke, Willfried, 4,422,340, Cl. 73-861.630.
Hodges, Robert J.: *See*—
Jackson, Thomas M.; and Hodges, Robert J., 4,423,402, Cl. 337-323.000.
Hodgson, Emory R., Jr.; and Rester, Darryl C., to Dynamics Corporation of America. Narrow-base terracing plow. 4,422,512, Cl. 172-454.000.
Hoechst Aktiengesellschaft: *See*—
Hahnle, Reinhard; Schneider, Manfred; Schuster, Claus; and Schickfluss, Rudolf, 4,422,854, Cl. 8-471.000.
Mohr, Reinhard; and Neeb, Rudolf, 4,423,226, Cl. 548-402.000.
Hoeks, Harold L.; and Robinson, Donald D. Tablet splitting device. 4,422,553, Cl. 206-528.000.
Hoelderich, Wolfgang; Mross, Wolf D.; and Schwarzmann, Matthias, to BASF Aktiengesellschaft. Preparation of olefins from methaol and/or dimethyl ether. 4,423,273, Cl. 585-640.000.
Hoezee, Doug, to Gerber Products Company. Food extruder. 4,422,372, Cl. 99-353.000.
Hoffman Controls Corp.: *See*—
Bowman, William W., 4,422,571, Cl. 236-49.000.
Hoffman, Ernst R. Off-set printing ink consumption prediction. 4,422,765, Cl. 356-432.000.
Hoffmann, Alexander: *See*—
Pusch, Gunter; Aisslinger, Dieter; and Hoffmann, Alexander, 4,423,104, Cl. 428-101.000.
Hoffmann-La Roche Inc.: *See*—
Dorn, Silvia; and Schwieter, Ulrich, 4,423,042, Cl. 424-200.000.
Hogg, James W., to Anchor Wire Corporation of Tennessee. Panel hanger. 4,422,608, Cl. 248-205.00A.
Hohman, Charles M.: *See*—
Propster, Mark A.; Hohman, Charles M.; and Seng, Stephen, 4,422,847, Cl. 432-28.000.
Holahan, Edward T.; and Disko, Harry, to Marvin Glass & Associates. Board game apparatus. 4,422,644, Cl. 273-249.000.
Holliday, William H., to Reynolds Metals Company. Insulated panel. 4,422,274, Cl. 52-410.000.
Holman, Daniel G.; and Ersek, Robert A. Photographic accessory. 4,422,759, Cl. 356-243.000.
Holmes, Joel P.: *See*—
Roy, John W., Jr.; Arbie, Melvin J.; and Holmes, Joel P., 4,423,015, Cl. 423-167.000.
Holthuisen, Arnoldus G., to Metaalwarenfabriek Venlo B.V. Mixing apparatus for two flowing liquids. 4,422,769, Cl. 366-178.000.
Holubka, Joseph W., to Ford Motor Company. Tertiary alcohol-diblocked diisocyanate diurea oligomers and coating compositions comprising same. 4,423,171, Cl. 523-454.000.
Homeyer, Bernhard: *See*—
Fuchs, Rainer; Naumann, Klaus; Behrenz, Wolfgang; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,423,066, Cl. 424-305.000.
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,423,058, Cl. 424-273.00P.
Hon Corporation: *See*—
Hon, David T., 4,422,663, Cl. 280-278.000.
Hon, David T., to Hon Corporation. Foldable and portable vehicle. 4,422,663, Cl. 280-278.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Inoue, Hidehiko; Nishikawa, Masao; and Anno, Nobuo, 4,422,662, Cl. 280-276.000.
Kameoka, Michitada, 4,422,688, Cl. 296-224.000.
Nebu, Hideaki, 4,422,659, Cl. 280-152.100.

Honda Giken Kogyo Kabushiki Kaisha & Furukawa Electric Co., Ltd.: *See—*
Sakurai, Yoshimi; Shinoda, Yutaka; and Nagata, Hideo, 4,422,699, Cl. 339-3.00S.

Honeywell Inc.: *See—*
Foss, Norman A., 4,423,325, Cl. 250-332.000.
Kompelien, Arlon D.; and Westley, Curtis E., 4,423,364, Cl. 318-440.000.
Place, William C., 4,423,408, Cl. 340-347.0NT.

Honeywell Information Systems Inc.: *See—*
Tague, Steven A.; and Negi, Virendra S., 4,423,483, Cl. 364-200.000.

Honl, Wolf-Dieter, to Repa Feinstanzwerk GmbH. Automatic roll-up device for a safety belt. 4,422,594, Cl. 242-107.40A.

Hooks, Haywood: *See—*
Wojtowicz, John A.; and Hooks, Haywood, 4,423,216, Cl. 544-192.000.

Hooper, Andre: *See—*
O'Shea, Ronald J.; Balkey, Joseph P.; Hooper, Andre; and Kelly, Richard A., III, 4,422,485, Cl. 141-98.000.

Hopkins, Harry C. Swimming simulator. 4,422,634, Cl. 272-71.000.

Hoppenrath, James W.: *See—*
Murphy, Michael P.; Stack, Gary F.; Hoppenrath, James W.; and Taylor, John R., 4,423,309, Cl. 219-270.000.

Hopson, Talmadge W., to National School Studios, Inc. Camera system. 4,422,745, Cl. 354-105.000.

Horie, Seiji; Nakano, Junji; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Electrophotographic light-sensitive hydrazone materials. 4,423,130, Cl. 430-59.000.

Horigome, Eiji: *See—*
Kawahara, Hiroshi; Azegami, Hitoshi; and Horigome, Eiji, 4,423,453, Cl. 360-131.000.

Horii, Hideo: *See—*
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Horiuchi, Eiji: *See—*
Iwawaki, Akira; Horiuchi, Eiji; Shinya, Sadahiko; Kojima, Kinshiro; Kodama, Katsuo; Kawarata, Kotaro; and Fukase, Hisahiko, 4,422,838, Cl. 425-376.00A.

Horwitz, Christopher M., to Massachusetts Institute of Technology. Process for selectively etching silicon. 4,422,897, Cl. 156-643.000.

Hoshino, Kunihisa: *See—*
Watanabe, Sakuji; Ogasawara, Akira; Terui, Nobuhiko; Hoshino, Kunihisa; and Utagawa, Ken, 4,422,739, Cl. 354-404.000.

Hoshino, Osamu; Ito, Michio; and Takeuchi, Akihiko, to Canon Kabushiki Kaisha. Developing apparatus. 4,422,749, Cl. 355-3.0DD.

Hoshino, Yasunari, to Nissan Motor Company, Limited. Closed cycle in-line double-acting hot gas engine. 4,422,292, Cl. 60-525.000.

Hosoe, Kazuya: *See—*
Masunaga, Makoto; Kinoshita, Takao; Sakane, Toshio; Tsunekawa, Tokuichi; Hosoe, Kazuya; Amikura, Takashi; and Harigaya, Isao, 4,422,741, Cl. 354-403.000.

Hosokawa, Motoyuki: *See—*
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Hosoya, Hisao; and Sato, Yukio, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus and method for bending a glass tube to a U shape. 4,422,863, Cl. 65-110.000.

Hospital for Sick Children, The: *See—*
Albisser, A. Michael; and Lougheed, William D., 4,423,039, Cl. 424-178.000.

Houk, LeRoy E., to Babcock & Wilcox Company, The. Stamping apparatus having magnetic supporting means. 4,422,783, Cl. 400-128.000.

Howard, James K.; and Srikrishnan, Kris V., to International Business Machines Corporation. Thin film capacitor with a dual bottom electrode structure. 4,423,087, Cl. 427-79.000.

Howarth, Roy B., to Mechanical Technology Incorporated. Stirling engine piston ring. 4,422,649, Cl. 277-75.000.

Huang, Chuan-Chih. Safety toilet seat. 4,422,190, Cl. 4-420.300.

Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, to Ciba-Geigy Corporation. Fungicidal N-(pyrrolidinoacetyl)-anilines. 4,423,059, Cl. 424-274.000.

Huchette, Michel: *See—*
Devos, Francis; Delobeau, Didier; Caboche, Jean-Jacques; Lemay, Patrick; and Huchette, Michel, 4,422,881, Cl. 127-46.100.
Devos, Francis; Bussiere, Guy; and Huchette, Michel, 4,423,086, Cl. 427-3.000.

Huffman, Theron M., to General Signal. Hydraulic control system for governing steering and implement actuators. 4,422,290, Cl. 60-404.000.

Hughes Helicopters, Inc.: *See—*
Munski, Michael S., 4,422,757, Cl. 356-138.000.

Hughes Tool Company: *See—*
Sweatman, Ronald E., 4,422,805, Cl. 405-225.000.
Wittman, Robert H.; Adkins, David E.; and Haws, Ronnie E., 4,422,477, Cl. 138-89.000.

Huhn, Karl; Lampelzammer, Helga; and Kaiser, Wolfgang, to Wacker-Chemie GmbH. Lubricating compositions for organic fibers. 4,423,092, Cl. 427-316.000.

Hull, Harvey C.; and Henz, Robert W., Sr., to Standard Register Company, The. Apparatus for cutting a continuous narrow strip into short sections. 4,422,358, Cl. 83-356.300.

Huller, Rolf: *See—*
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Humber, Leslie G.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; and Ferland, Jean-Marie, 4,423,232, Cl. 548-472.000.

Humphreys, John L. Method for recording a magnetic audio tape and apparatus for generating a television signal from the recorded magnetic audio tape. 4,423,444, Cl. 360-79.000.

Hums, Dieter; Hartmann, Armin; Lippe, Klaus F.; and Wetzig, Werner, to Intong AB. Method of producing hydrothermally cured aerated concrete building units. 4,422,989, Cl. 264-42.000.

Hunt, Chester J.: *See—*
Peeler, George D. M.; Hunt, Chester J.; DaMocogno, Ninalbo G.; and Conti, Richard J., 4,423,421, Cl. 343-771.000.

Hunt, Richard L., to Frazier, David C. Fireplace adapters. 4,422,439, Cl. 126-123.000.

Hunt, Roger W.; Miller, Brian T.; and Schroeder, Donald R., to CTS Corporation. Process for producing crystal resonators. 4,422,226, Cl. 29-25.350.

Hunt, Vicki L., to Ron-Vik, Incorporated. Flower pot holder. 4,422,610, Cl. 248-311.200.

Hurwitt, Steven D.: *See—*
Class, Walter H.; Hurwitt, Steven D.; Hill, Michael L.; and Hutt, Marvin K., 4,422,896, Cl. 156-643.000.

Husky Injection Molding Systems Ltd.: *See—*
Schad, Robert D., 4,422,995, Cl. 264-250.000.

Husqvarna Aktiebolag: *See—*
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Huston, Rolland E.: *See—*
Nelson, John E.; Hammond, Charles W.; Huston, Rolland E.; and Helton, Michael R., 4,422,882, Cl. 134-22.180.

Hutchings, Thomas J.; and Babcock, Gary D., to Litton Systems, Inc. Ring laser. 4,422,762, Cl. 356-350.000.

Hutt, Marvin K.: *See—*
Class, Walter H.; Hurwitt, Steven D.; Hill, Michael L.; and Hutt, Marvin K., 4,422,896, Cl. 156-643.000.

Hydrowatt Systems Limited: *See—*
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Hyzak, Daniel L.; and Pallos, Ferenc M., to Stauffer Chemical Company. Halogenated allylthioisopropyl N-methylcarbamates as herbicide extenders. 4,422,869, Cl. 71-100.000.

Iacovangelo, Charles D.; and Zarnoch, Kenneth P., to General Electric Company. Electrode for molten carbonate fuel cell. 4,423,122, Cl. 429-45.000.

Ichikawa, Satoru: *See—*
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Ichinomiya, Keiji: *See—*
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ICI Americas Inc.: *See—*
Barrett, Joseph A., 4,422,381, Cl. 102-202.200.

Idota, Yoshinori: *See—*
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Ignesti, Amleto: *See—*
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Ikari, Kunihiro: *See—*
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Ikeda, Takashi: *See—*
Ogata, Yoshiro; Yamazaki, Haruo; Ikeda, Takashi; and Akutsu, Hidezoh, 4,423,353, Cl. 313-631.000.

Ikemori, Keiji: *See—*
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Ila, Lajos: *See—*
Korosi, Jeno; Lang, Tibor; Andrasi, Ferene; Szekely, Jozsef; Hamori, Tamas; Balogh, Tibor; Ila, Lajos; Goldschmidt, Katalin; Sineger, Eleonora; and Moravcsik, Imre, 4,423,044, Cl. 424-244.000.

Illers, Karl H.: *See—*
Brandstetter, Franz; Echte, Adolf; Hambrecht, Juergen; Illers, Karl H.; and Priebe, Edmund, 4,423,187, Cl. 525-68.000.

Illg, Peter, to SKF Kugellagerfabriken GmbH. Roller assembly. 4,422,227, Cl. 29-116.00R.

Imai, Kin-ichi; and Mano, Mitsuhiko, to Takeda Chemical Industries, Ltd. Production of purine derivatives and intermediates therefor. 4,423,219, Cl. 544-326.000.

Imaizumi, Ichiro; Ochi, Shikayuki; Kimura, Masatoshi; Yoshimura, Masayoshi; Yamaguchi, Takashi; and Koda, Toyomasa, to Hitachi, Ltd. High-breakdown-voltage resistance element for integrated circuit with a plurality of multilayer, overlapping electrodes. 4,423,433, Cl. 357-51.000.

IMI Kynoch Limited: *See—*
Neal, Donald F.; and Blenkinsop, Paul A., 4,422,887, Cl. 148-133.000.

IMI Marston Limited: *See—*
Grosvenor, Ronald L.; and Fox, Michael, 4,422,561, Cl. 220-461.000.
Hayfield, Peter C. S., 4,422,917, Cl. 204-196.000.

Imperial Chemical Industries Limited: *See*—
Jones, Geraint; Preston, John; and Thomson, David S., 4,423,070, Cl. 424-311.000.
Imperial Chemical Industries PLC: *See*—
Brown, David; Dowell, Robert I.; Hargreaves, Rodney B.; and Main, Brian, 4,423,045, Cl. 424-246.000.
Geller, John M. E.; and Wilson, John P., 4,422,379, Cl. 102-206.000.
Plichta, Bohumil M. J., 4,422,378, Cl. 102-206.000.
INA Walzlager Schaeffler KG: *See*—
Gugel, Georg; and Kaiser, Theodor, 4,422,697, Cl. 308-175.000.
Ritter, Joachim; and Neuwirth, Ernst, 4,422,537, Cl. 192-45.000.
Inaba, Koji: *See*—
Shimizu, Tsutomu; Inaba, Koji; and Araki, Naomiki, 4,422,735, Cl. 351-206.000.
Ingebrigtsen, Janis: *See*—
Seeney, Charles E.; Kraemer, John F.; and Ingebrigtsen, Janis, 4,422,496, Cl. 164-528.000.
Ingenjorsfirman Installationsjanst AB: *See*—
Anderson, Stig, 4,422,327, Cl. 73-303.000.
Ingersoll-Rand Company: *See*—
Ellison, Bruce; and DeCarteret, James A., 4,422,811, Cl. 408-204.000.
Inmont: *See*—
Guagliardo, Matthew, 4,423,179, Cl. 524-539.000.
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Sakurai, Yukio; Okajima, Masao; and Inoue, Arifumi, 4,422,572, Cl. 237-12.30B.
Inoue, Hidehiko; Nishikawa, Masao; and Anno, Nobuo, to Honda Giken Kogyo Kabushiki Kaisha. Front fork construction for motorcycle. 4,422,662, Cl. 280-276.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,422,918, Cl. 204-206.000.
Shimizu, Akihiko, 4,423,302, Cl. 219-69.00G.
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Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,423,061, Cl. 424-274.000.
Institut Francais du Petrole: *See*—
Juguin, Bernard; Cosyns, Jean; and Miquel, Jean, 4,423,264, Cl. 585-255.000.
Maldonado, Paul; Cohen, Choua; and Sillion, Bernard, 4,422,856, Cl. 44-63.000.
Rojey, Alexandre, 4,422,297, Cl. 60-651.000.
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Grant, Barbara D.; Hilden, Magdalena M.; Jones, Carol R.; and Sincerbox, Glenn T., 4,422,713, Cl. 350-3.610.
International Business Machines Corporation: *See*—
Bauer, Wayne J.; Dodt, William C.; Kirkpatrick, Charles R.; Rehage, Ted A.; Robinson, Francis L.; and Taylor, William K., 4,423,480, Cl. 364-200.000.
Byrnes, Herbert P.; and Wahl, Richard, 4,423,376, Cl. 324-158.00P.
Eardley, David B., 4,423,338, Cl. 307-273.000.
Engelman, Jeffery A.; and Sanford, James L., 4,423,357, Cl. 315-307.000.
Howard, James K.; and Srikrishnan, Kris V., 4,423,087, Cl. 427-79.000.
Pfeiffer, Hans C., 4,423,305, Cl. 219-121.0EU.
Reese, Dennis L.; Regehr, John L.; Schierhorst, Albert E.; Soderstrom, Ronald L.; and Thomason, James M., 4,423,425, Cl. 346-76.0PH.
International Coal Refining Company: *See*—
Thorogood, Robert M., 4,422,411, Cl. 122-7.00R.
International Minerals & Chemical Corp.: *See*—
Seeney, Charles E.; Kraemer, John F.; and Ingebrigtsen, Janis, 4,422,496, Cl. 164-528.000.
International Shoe Machine Corporation: *See*—
Christenbery, Frederick L., 4,422,197, Cl. 12-1.00A.
International Telephone and Telegraph Corporation: *See*—
Sawyer, Edgar W., Jr., 4,422,855, Cl. 44-51.000.
Intersil, Inc.: *See*—
Evans, Lee L., 4,423,385, Cl. 330-9.000.
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Hums, Dieter; Hartmann, Armin; Lippe, Klaus F.; and Wetzig, Werner, 4,422,989, Cl. 264-42.000.
Ioannesian, Rolen A.; and Ionesian, Jury R. Turbodrill. 4,422,823, Cl. 415-199.500.
Ionesian, Jury R.: *See*—
Ioannesian, Rolen A.; and Ionesian, Jury R., 4,422,823, Cl. 415-199.500.
Iowa Manufacturing Company of Cedar Rapids, Iowa: *See*—
Musil, Joseph E., 4,422,848, Cl. 432-118.000.
Irie, Yasuo: *See*—
Yasuda, Naohiko; Iwagami, Hisao; Irie, Yasuo; Nakanishi, Eiji; and Saito, Hideomi, 4,423,215, Cl. 544-025.000.
Irii, Shinsuke: *See*—
Iwasaki, Hiroshi; Irii, Shinsuke; and Omura, Haruo, 4,423,091, Cl. 427-213.340.
Isbrandt, Russell R.; and Lowrey, Robert D., to Minnesota Mining and Manufacturing Company. Stabilizer combination for dye oxidation. 4,423,139, Cl. 430-338.000.
Isco, Inc.: *See*—
Allington, Robert W., 4,422,942, Cl. 210-659.000.
Ishida, Hideaki: *See*—
Ishii, Hiroshi; and Ishida, Hideaki, 4,422,361, Cl. 84-1.180.
Ishida, Tokuji: *See*—
Izumi, Tatsuro; Taniguchi, Nobuyuki; Matsumoto, Toshiaki; Niwa, Masatake; Ishida, Tokuji; and Itoh, Masatoshi, 4,422,743, Cl. 354-415.000.
Ishigooboka, Norikazu: *See*—
Suzuki, Hirosuke; and Ishigooboka, Norikazu, 4,423,282, Cl. 174-36.000.
Ishii, Hiroshi; and Ishida, Hideaki, to Casio Computer Co., Ltd. Electronic musical instrument. 4,422,361, Cl. 84-1.180.
Ishikawa, Shozo: *See*—
Takasu, Yoshio; Sakai, Kiyoshi; Mabuchi, Minoru; Ishikawa, Shozo; and Watanabe, Katsunori, 4,423,129, Cl. 430-59.000.
Ishikawa, Youhei: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Ito, Yoji, 4,423,397, Cl. 333-219.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Iwawaki, Akira; Horiuchi, Eiji; Shinya, Sadahiko; Kojima, Kinshiro; Kodama, Katsuo; Kawarata, Kotaro; and Fukase, Hisahiko, 4,422,838, Cl. 425-376.00A.
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Ishogai, Nobuo; Motoyuki, Hosokawa; Takashi, Okawa; Wakui, Natsuko; and Watanabe, Toshiyasu, to Agency of Industrial Science and Technology. Process for producing ethanol. 4,423,258, Cl. 568-902.000.
Iso, Tadashi: *See*—
Iwao, Junichi; Oya, Masayuki; Baba, Toshio; Iso, Tadashi; and Chiba, Takehisa, 4,423,054, Cl. 424-270.000.
Isogai, Nobuo; Hosokawa, Motoyuki; Okawa, Takashi; Wakui, Natsuko; and Watanabe, Toshiyasu, to Seiichi Ishizaka, President of Agency of Industrial Science and Technology. Process for producing ethanol. 4,423,257, Cl. 568-902.000.
Isohata, Junji; and Yamamoto, Hironori, to Canon Kabushiki Kaisha. Projection-printing apparatus. 4,422,754, Cl. 355-43.000.
Itek Corporation: *See*—
Pearlman, Lester S., 4,423,418, Cl. 343-17.700.
Ito, Kenichi: *See*—
Musha, Tohru; Kato, Kiichi; and Ito, Kenichi, 4,423,495, Cl. 369-45.000.
Ito, Michio: *See*—
Hoshino, Osamu; Ito, Michio; and Takeuchi, Akihiko, 4,422,749, Cl. 355-3.0DD.
Ito, Nobuo: *See*—
Kitamura, Nobuyoshi; Ito, Nobuo; and Takeuchi, Koji, 4,423,175, Cl. 524-100.000.
Ito, Osamu: *See*—
Sami, Hiroshi; Ito, Osamu; Kawai, Shizuo; Hobo, Nobuhito; Nishio, Teruo; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,423,485, Cl. 364-431.050.
Ito, Yoji: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Ito, Yoji, 4,423,397, Cl. 333-219.000.
Itoh, Hiroshi: *See*—
Komoda, Norio; Kobayashi, Nobuyuki; Itoh, Hiroshi; Nishimura, Yozi; and Obara, Shigenobu, 4,422,497, Cl. 165-23.000.
Itoh, Masatoshi: *See*—
Izumi, Tatsuro; Taniguchi, Nobuyuki; Matsumoto, Toshiaki; Niwa, Masatake; Ishida, Tokuji; and Itoh, Masatoshi, 4,422,743, Cl. 354-415.000.
ITT Industries, Inc.: *See*—
Jackson, Thomas M.; and Hodges, Robert J., 4,423,402, Cl. 337-323.000.
Schopper, Bernd; and Berisch, Volker, 4,422,694, Cl. 303-84.00A.
Iverson, James R.; Tell, Ernest L.; and Pinotti, Terry L., to McGraw-Edison Company. Electromechanically controlled automatic transfer switch and bypass switch assembly. 4,423,336, Cl. 307-64.000.
Iwagami, Hisao: *See*—
Yasuda, Naohiko; Iwagami, Hisao; Irie, Yasuo; Nakanishi, Eiji; and Saito, Hideomi, 4,423,215, Cl. 544-025.000.
Iwaki, Shunichi, to Casio Computer Co., Ltd. Drive control system for display devices. 4,422,365, Cl. 84-478.000.
Iwao, Junichi; Oya, Masayuki; Baba, Toshio; Iso, Tadashi; and Chiba, Takehisa, to Santen Pharmaceutical Co., Ltd. Antihypertensive 4-thiazolidinecarboxylic acids (substituted alkyl derivatives). 4,423,054, Cl. 424-270.000.
Iwasaki, Hiroshi; Irii, Shinsuke; and Omura, Haruo, to Kanzaki Paper Manufacturing Co., Ltd. Method of making microcapsules. 4,423,091, Cl. 427-213.340.
Iwawaki, Akira; Horiuchi, Eiji; Shinya, Sadahiko; Kojima, Kinshiro; Kodama, Katsuo; Kawarata, Kotaro; and Fukase, Hisahiko, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Extrusion head for use in blow molding machine. 4,422,838, Cl. 425-376.00A.
Izuha, Akira; Shinano, Tomoyuki; Shibayama, Yuho; Kurata, Chikatoshi; and Fujii, Kenichi, to Kawasaki Jukogyo Kabushiki Kaisha. Method of combustion of pulverized coal by pulverized coal burner. 4,422,391, Cl. 110-347.000.
Izumi, Tatsuro; Taniguchi, Nobuyuki; Matsumoto, Toshiaki; Niwa, Masatake; Ishida, Tokuji; and Itoh, Masatoshi, to Minolta Camera Kabushiki Kaisha. Exposure system for a camera. 4,422,743, Cl. 354-415.000.
J. M. Huber Corporation: *See*—
Wason, Satish K.; and Mays, Robert K., 4,422,880, Cl. 106-288.00B.
J.S. Staedtler K.G.: *See*—
Rosel, Hans-Dieter, 4,423,429, Cl. 346-140.00R.

Jachowski, Ronald E.; and Brown, Louis E., to Decibel Products, Inc. Internal bi-metallic temperature compensating device for tuned cavities. 4,423,398, Cl. 333-229.000.

Jackisch, Philip F., to Ethyl Corporation. Preparation of dibromostyrene. 4,423,262, Cl. 570-193.000.

Jackson, Alan D.; and Stucky, Dennis J., to Cessna Aircraft Company, The. Flow limiting valve. 4,422,470, Cl. 137-484.200.

Jackson, David E., to Nalco Chemical Company. Method for protecting porous ceramic building materials exposed to weathering. 4,423,096, Cl. 427-397.700.

Jackson, Leon D.; and Morris, Dan O., to LDJ Electronics, Inc. Bulk tape eraser with rotating magnetic field. 4,423,460, Cl. 361-151.000.

Jackson, Terrell D.: *See*—
Dunham, H. E.; Arana, David; Jackson, Terrell D.; McEuen, Brent E.; and Schneider, John A., 4,422,624, Cl. 266-182.000.

Jackson, Thomas M.; and Hodges, Robert J., to ITT Industries, Inc. Temperature sensitive capsules. 4,423,402, Cl. 337-323.000.

Jacobi-Branston Inc.: *See*—
Branston, Keith, 4,422,265, Cl. 51-52.00R.

Jacobi, Edgar F.; and Winkler, Robert J. Wave motion electric generator. 4,423,334, Cl. 290-53.000.

Jacobs, Keith R., to Kirk, Linton James. Racking. 4,422,555, Cl. 211-74.000.

Jacobs, Terry. Spa or hot tub cover. 4,422,192, Cl. 4-498.000.

Jacobs, William R.; Karlin, Richard A.; and Sun, Peter K., to Sun Electric Corporation. Battery testing techniques. 4,423,379, Cl. 324-429.000.

Jacobsen, Hans, to Micronic AB. Communication link. 4,423,319, Cl. 235-472.000.

Jacquet, Bernard; and Lang, Gerard, to L'Oreal. Hair dyeing compositions containing quaternized polymer. 4,422,853, Cl. 8-406.000.

Jager, Horst: *See*—
Wilke, Rudolf; Jager, Horst; and Scholl, Winfried, 4,422,616, Cl. 248-544.000.

Jahn, Dieter: *See*—
Becker, Rainer; Jahn, Dieter; Rohr, Wolfgang; Himmele, Walter; Siegel, Hardo; and Wuerzer, Bruno, 4,422,864, Cl. 71-88.000.

James River-Dixie/Northern, Inc.: *See*—
Pawlowski, Thomas D., 4,422,551, Cl. 206-461.000.

Jammot, Fernand: *See*—
Chignac, Michel; Grain, Claude; Jammot, Fernand; Pigerol, Charles; Eymard, Pierre; and Ferrandes, Bernard, 4,423,071, Cl. 424-311.000.

Janiga, Eugene R., to Masonite Corporation. Lignosulfonate-phenol-formaldehyde resin binder. 4,423,173, Cl. 524-14.000.

Janssens, Wilhelmus, to AGFA-Gevaert, N.V. Photographic silver halide color materials and process for the production of dye images by diffusion transfer. 4,423,142, Cl. 430-504.000.

Jarriand, Paul: *See*—
Casacci, Severin; and Jarriand, Paul, 4,422,826, Cl. 416-157.00R.

Jautelat, Manfred; and Arlt, Dieter, to Bayer Aktiengesellschaft. Process for the preparation of 2,2-dimethyl-3-vinyl-cyclopropanecarboxylic acids and esters. 4,423,243, Cl. 560-124.000.

Jaworski, William R., to Jope Manufacturing Company Inc. Hydrotherapy jet for tubs, spas or pools. 4,422,191, Cl. 4-496.000.

Jefferson, John R., to Lucas Industries Limited. Fuel injection pump. 4,422,425, Cl. 123-450.000.

Jersey Nuclear-Avco Isotopes, Inc.: *See*—
Morton, Richard G., 4,423,511, Cl. 372-95.000.

Jezbera, Val K., to Dataproducts Corporation. Print hammer and coil assembly. 4,422,377, Cl. 101-93.290.

Joffe, Boris B.: *See*—
Spongr, Jerry J.; Tiebor, John E.; and Joffe, Boris B., 4,423,328, Cl. 250-358.100.

Jog-O-Lite, Inc.: *See*—
Kirkley, J. Darrell, 4,423,473, Cl. 362-186.000.

Johannessen, Paul R., to Megapulse Incorporated. Pulsed, pseudo random position fixing radio navigation method and system and the like. 4,423,419, Cl. 343-387.000.

Johansen, Steinar, to Masto Wireservice A/S. Method and apparatus for lubricating steel cable. 4,422,529, Cl. 184-15.00R.

John D. Brush & Co., Inc.: *See*—
Carpenter, Britt C., 4,422,386, Cl. 109-59.00R.

John Fluke Mfg. Co., Inc.: *See*—
Gurol, I. Macit; and Bang, Gary M., 4,423,299, Cl. 210-159.00B.

Johnson, David E.; McCall, Kenneth E.; and Coughlin, William J., to Arcair Company. All position tractor. 4,422,384, Cl. 105-29.00R.

Johnson, Garland A.; and Peuler, Jacob D., to Upjohn Company, The. Radioenzymatic assay of catecholamines. 4,423,144, Cl. 435-15.000.

Johnson, Herbert; Elliott, Richard M.; Herdeg, Donald F.; and Peck, Alan M., to USM Corporation. Sewing machine having automatic pallet handling. 4,422,393, Cl. 112-121.500.

Johnson, John K.: *See*—
Earhart, Jack R.; Langdon, Freddie J.; and Johnson, John K., 4,422,771, Cl. 366-251.000.

Johnson & Johnson: *See*—
Willstead, Donald A., 4,423,101, Cl. 428-76.000.

Johnson & Johnson Products, Inc.: *See*—
Clum, Charles E.; and Felty, Lanny G., 4,423,041, Cl. 424-184.000.

Johnson, Russell W.: *See*—
Lawson, Randy J.; Johnson, Russell W.; and Hilfman, Lee, 4,422,959, Cl. 502-247.000.

Johnson, Thomas H., to Shell Oil Company. Olefin isomerization process. 4,423,276, Cl. 585-665.000.

Jones, Carol R.: *See*—
Grant, Barbara D.; Hilden, Magdalena M.; Jones, Carol R.; and Sincerbox, Glenn T., 4,422,713, Cl. 350-3.610.

Jones, Geraint; Preston, John; and Thomson, David S., to Imperial Chemical Industries Limited. Esters. 4,423,070, Cl. 424-311.000.

Jones, Thomas H., to Litton Industrial Products, Inc. Liquid cooled eddy current coupling having rotor extension ring. 4,423,344, Cl. 310-105.000.

Jones, Thomas R.: *See*—
Hahn, Robert E.; Jones, Thomas R.; and Berning, Peter H., 4,422,721, Cl. 350-164.000.

Jope Manufacturing Company Inc.: *See*—
Jaworski, William R., 4,422,191, Cl. 4-496.000.

Jorgenson, Gordon K., to C-I-L Inc. Borehole charging method including toroidal transformer cores. 4,422,380, Cl. 102-313.000.

Josefsson, Bertil, to NPI New Products Investment AB. Apparatus for the forming of hair. 4,422,464, Cl. 132-9.000.

Joseph B. Stinson Co.: *See*—
Van Nette, Adair B., III, 4,422,495, Cl. 164-324.000.

Jos. Habegger, AG: *See*—
Grunig, Kurt, 4,422,654, Cl. 279-4.000.

Joyce, James J.: *See*—
Wilson, Wayne D.; and Joyce, James J., 4,422,647, Cl. 273-411.000.

Juda, Walter; Allen, Robert J.; Lindstrom, Robert; and Bar-Ilan, Amiran, to Prototech Company. Method of recovering hydrogen-reduced metals, ions and the like at porous catalytic barriers and apparatus therefor. 4,422,911, Cl. 204-106.000.

Juguin, Bernard; Cosyns, Jean; and Miquel, Jean, to Institut Francais du Petrole. Process for the joint production of highly pure 1-butene and premium gasoline from a $C_4$ olefinic cut. 4,423,264, Cl. 585-255.000.

Juhola, Pentti; and Artamo, Arvi, to Rintekno Oy. Apparatus and method for the vaporization of liquid. 4,422,899, Cl. 159-13.00B.

Jujo Paper Co., Ltd.: *See*—
Hasegawa, Akira; Shimizu, Ippei; Kaneko Toshio; and Miyake, Sumio, 4,422,670, Cl. 282-27.500.

Junta de Energia Nuclear: *See*—
De Burgos Garcia, Eduardo; Goni Unzue, A. Javier; Gutierrez Barranco, Juan M.; and Pajares Suarez, Juan A., 4,423,329, Cl. 250-374.000.

Kaainoa, Stephen H.; and Kafer, Kenneth G., to Enercon Industries Corporation. Power supply for corona discharge treatment system. 4,423,461, Cl. 361-235.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Arakawa, Hiroshi; and Mitsuya, Kinpei, 4,422,484, Cl. 139-435.000.

Kabushiki Kaisha Toyota Chuo Kenyusho: *See*—
Sugiyama, Katsuhiko; Ohsawa, Katsuyuki; Fujikake, Kenji; and Idota, Yoshinori, 4,422,423, Cl. 123-438.000.

Kadin, Saul B., to Pfizer Inc. Antiallergic and antiulcer 1-oxo-1H-thiazolo[3,2-a]pyrimidine-2-carboxamides and intermediates therefor. 4,423,048, Cl. 424-251.000.

Kadoory, Shlomo J., to Revlon, Inc. Cosmetic displayer and dispenser. 4,422,545, Cl. 206-45.340.

Kaeding, Jeanne E.: *See*—
Corvan, Peter J.; Kaeding, Jeanne E.; Rodriguez, Cesar; and Rule, Norman G., 4,423,203, Cl. 528-266.000.

Kafer, Kenneth G.: *See*—
Kaainoa, Stephen H.; and Kafer, Kenneth G., 4,423,461, Cl. 361-235.000.

Kageyama, Katsuhiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Ion generating apparatus. 4,423,355, Cl. 315-111.810.

Kahlcke, Hartwig: *See*—
Falkenbach, Gunther; Seuwen, Dieter; Schneider, Jurgen; and Kahlcke, Hartwig, 4,422,343, Cl. 74-16.000.

Kaiser, Charlie J., to RCA Corporation. Substrate for optical recording media and information records. 4,423,427, Cl. 346-135.100.

Kaiser, Theodor: *See*—
Gugel, Georg; and Kaiser, Theodor, 4,422,697, Cl. 308-175.000.

Kaiser, Wolfgang: *See*—
Huhn, Karl; Lampelzammer, Helga; and Kaiser, Wolfgang, 4,423,092, Cl. 427-316.000.

Kajima Kensetsu Kabushiki Kaisha: *See*—
Hatanaka, Misao, 4,422,930, Cl. 210-150.000.

Kajimoto, Norifumi; Kawakami, Yoshio; and Sasaki, Kinji, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,423,452, Cl. 360-131.000.

Kakizaki, Yukio: *See*—
Abe, Nobutoshi; Kakizaki, Yukio; and Kobayashi, Jiro, 4,422,547, Cl. 206-328.000.

Kalamchi, Ali. Spinal compression and distraction instrumentation. 4,422,451, Cl. 128-69.000.

Kalberer, Felix. Device for the removal of heat from waste water. 4,422,932, Cl. 210-186.000.

Kalinowski, Robert E.; and Vincent, Gary A., to Dow Corning Corporation. Method for durable press finish using formaldehyde-free organosilicon compositions and textile therefrom. 4,423,108, Cl. 428-266.000.

Kaltz, Milton C.; Chojnowski, Edward M.; Garascia, David C.; Bauer, Barney J.; and George, Richard D., to American Sunroof Corporation. Sliding roof panel assembly. 4,422,687, Cl. 296-221.000.

Kamei, Masanori: *See*—
Kuwabara, Shigeo; and Kamei, Masanori, 4,423,428, Cl. 346-139.00C.

Kameoka, Michitada, to Honda Giken Kogyo Kabushiki Kaisha. Latching device for a detachably attachable roof panel in a vehicle. 4,422,688, Cl. 296-224.000.

Kaminski, Joanne M.; Bauer, Ludwig; and Zaneveld, Lourens, to University of Illinois Foundation. Contraceptive method. 4,423,069, Cl. 424-310.000.

Kanbe, Junichiro; Shirai, Shigeru; Ogawa, Kyosuke; Saitoh, Keishi; and Osato, Yoichi, to Canon Kabushiki Kaisha. Photoconductive member of amorphous silicon. 4,423,133, Cl. 430-95.000.

Kaneko Toshio: *See*—
Hasegawa, Akira; Shimizu, Ippei; Kaneko Toshio; and Miyake, Sumio, 4,422,670, Cl. 282-27.500.

Kanno, Masashi: *See*—
Danno, Tsuneo; Kanno, Masashi; and Murata, Eiichiro, 4,423,517, Cl. 375-1.000.

Kanou, Noboru: *See*—
Yamamoto, Junji; Kanou, Noboru; and Usami, Masayuki, 4,422,689, Cl. 296-224.000.

Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Iwasaki, Hiroshi; Irii, Shinsuke; and Omura, Haruo, 4,423,091, Cl. 427-213.340.

Kao Soap Co., Ltd.: *See*—
Abe, Yoshiaki; and Tsushima, Rikio, 4,423,032, Cl. 424-70.000.

Kaplan, James H.; and Lissauer, Joel S., to Harlan Material Handling Corporation. Apparatus for manual rotation of motor vehicle driving wheels through propeller shaft and differential. 4,422,656, Cl. 280-3.000.

Kaplan, Steve E. Moulding duct. 4,423,284, Cl. 174-101.000.

Kaplin, Edward J.: *See*—
Lewis, David F.; and Kaplin, Edward J., 4,423,152, Cl. 436-56.000.

Kaplon, David A.: *See*—
Croci, Dana; and Kaplon, David A., 4,422,709, Cl. 339-176.0MF.

Karl Lauteschlager KG: *See*—
Lautenschlager, Karl; and Lautenschlager, Gerhard, 4,422,214, Cl. 16-291.000.

Karlin, Richard A.: *See*—
Jacobs, William R.; Karlin, Richard A.; and Sun, Peter K., 4,423,379, Cl. 324-429.000.

Karnofsky, George B., to Dravo Corporation. Apparatus for the continuous solvent extraction of bitumen from oil-bearing sand. 4,422,901, Cl. 196-14.520.

Kasahara, Nobuo; Nakahara, Tosio; and Yano, Hidetoshi, to Ricoh Company, Ltd. Color electrostatographic apparatus. 4,422,405, Cl. 118-658.000.

Kasai, Shigeo, to Amada Company, Limited. Clamping apparatus. 4,422,628, Cl. 269-71.000.

Kashiwagi, Minoru: *See*—
Nakajima, Shigeharu; Ichinomiya, Keiji; Okada, Koichi; Tsuchikura, Kaname; and Kashiwagi, Minoru, 4,423,349, Cl. 313-487.000.

Kasper, Alan H., to Allied Corporation. Cable strain relief for an electrical connector. 4,422,705, Cl. 339-103.00M.

Kataita, Masafumi: *See*—
Yamamoto, Ryuichi; Takagi, Akinobu; Kataita, Masafumi; Obata, Kenji; and Mori, Shigeki, 4,422,976, Cl. 260-453.0PH.

Kataoka, Mitsugi: *See*—
Omori, Hiroyuki; Takeda, Makoto; Fujita, Koichi; and Kataoka, Mitsugi, 4,422,981, Cl. 260-465.80D.

Katayama, Yoshihiko: *See*—
Matsumoto, Koichi; Katayama, Yoshihiko; and Sakurai, Hisaya, 4,423,185, Cl. 525-66.000.

Katchka, Jay R.: *See*—
Graham, Marvin M.; and Katchka, Jay R., 4,422,844, Cl. 431-72.000.

Kato, Hiroshi; and Numata, Masanori, to Amano Corporation. Time recorder. 4,423,314, Cl. 235-377.000.

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Kato, Kiichi: *See*—
Musha, Tohru; Kato, Kiichi; and Ito, Kenichi, 4,423,495, Cl. 369-45.000.

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Nakagawa, Nobuaki; Kotani, Kikuo; Katsuragi, Shigeo; Morita, Kaoru; Ohyama, Kunio; and Noda, Toshiharu, 4,423,034, Cl. 424-85.000.

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Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,423,213, Cl. 544-16.000.

Kawada, Toyoshi: *See*—
Sato, Sei; Wakitani, Masayuki; Oki, Kenichi; Miura, Shoshin; Yamaguchi, Hisashi; Miyashita, Yoshinori; Shinoda, Tsutae; Yoshikawa, Kazuo; Kurahashi Keizo; and Kawada, Toyoshi, 4,423,356, Cl. 315-169.200.

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Watanabe, Nobuatsu; Nakajima, Tsuyoshi; and Kawaguchi, Masayuki, 4,423,261, Cl. 570-150.000.

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Sami, Hiroshi; Ito, Osamu; Kawai, Shizuo; Hobo, Nobuhito; Nishio, Teruo; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,423,485, Cl. 364-431.050.

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Kawakami, Yoshio: *See*—
Kajimoto, Norifumi; Kawakami, Yoshio; and Sasaki, Kinji, 4,423,452, Cl. 360-131.000.

Kawamura, Sadao, to Showa Manufacturing Co., Ltd. Height adjusting system for motorcycle. 4,422,661, Cl. 280-276.000.

Kawarata, Kotaro: *See*—
Iwawaki, Akira; Horiuchi, Eiji; Shinya, Sadahiko; Kojima, Kinshiro; Kodama, Katsuo; Kawarata, Kotaro; and Fukase, Hisahiko, 4,422,838, Cl. 425-376.00A.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Izuha, Akira; Shinano, Tomoyuki; Shibayama, Yuho; Kurata, Chikatoshi; and Fujii, Kenichi, 4,422,391, Cl. 110-347.000.

Kawasaki, Kikuo; Sano, Tomomi; and Yoshida, Kazuo, to Fuji Electric Co., Ltd. Wire data transmission system. 4,423,506, Cl. 370-85.000.

Kawasaki Steel Corporation: *See*—
Yamada, Hirosuke; and Omori, Hisashi, 4,422,873, Cl. 75-52.000.

Kawata, Shun, to Konishiroku Photo Industry Co., Ltd. Developer replenishing device. 4,422,750, Cl. 355-3.0DD.

Kawata, Takao: *See*—
Shimura, Haruo; and Kawata, Takao, 4,422,895, Cl. 156-633.000.

Kazami, Kazuyuki: *See*—
Naito, Hideshi; Nozawa, Hideyo; and Kazami, Kazuyuki, 4,423,470, Cl. 362-17.000.

KCR Technology, Inc.: *See*—
Kegelman, Thomas D., 4,423,354, Cl. 315-12.00R.

Kegelman, Thomas D., to KCR Technology, Inc. Method and apparatus for controlling electrode voltage in electron beam tubes. 4,423,354, Cl. 315-12.00R.

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Blackford, John E.; Kelly, John J.; and Baker, Philip A., 4,422,673, Cl. 285-23.000.

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O'Shea, Ronald J.; Balkey, Joseph P.; Hooper, Andre; and Kelly, Richard A., III, 4,422,485, Cl. 141-98.000.

Kemper, Hermanus C.; and Versluis, Pieter, to Lever Brothers Company. Bleach activator granules and preparation thereof. 4,422,950, Cl. 252-186.380.

Kendall, Ronald L.: *See*—
Tuckett, Larry L.; and Kendall, Ronald L., 4,422,678, Cl. 292-264.000.

Kennedy, Thorburn S.: *See*—
Armstrong, Errol C.; Hanacek, William A.; Hermann, Paul F.; and Kennedy, Thorburn S., 4,422,990, Cl. 264-45.300.

Kent, Eric G., to Polysar Limited. Polyethylene-polybutadiene blend. 4,423,181, Cl. 524-425.000.

Kepiro, Joseph. Buckle. 4,422,219, Cl. 24-176.000.

Kerfoot, O. C.: *See*—
Yang, Kang; Reedy, James D.; McGuire, S. E.; and Kerfoot, O. C., 4,423,278, Cl. 585-823.000.

Kerk, Klaus: *See*—
Mueller, Dieter; Lobig, Inge; and Kerk, Klaus, 4,422,268, Cl. 52-86.000.

Kerllenevich, Betty: *See*—
Benoit, Pierre; Pellaux, Jean-Paul; Widmer, Gilbert; Kerllenevich, Betty; and Coche, Andre, 4,422,714, Cl. 350-96.150.

Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung: *See*—
Becker, Erwin-Willy; Ehrfeld, Wolfgang; Krieg, Gunther; and Bier, Wilhelm, 4,422,905, Cl. 204-9.000.

Kharkhuta, Nikolai Y.: *See*—
Shestopalov, Alexandr A.; Denikin, Ernst I.; Kharkhuta, Nikolai Y.; Vasiliev, Alexandr A.; and Okunev, Vyacheslav I., 4,422,778, Cl. 374-135.000.

Kikuchi, Keisuke; Morikawa, Takitaro; Shimada, Junichi; and Sakurai, Kenjiro, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Cladded spherical lens having uneven refractive index. 4,422,733, Cl. 350-413.000.

Kikuta, Masaaki: *See*—
Otsuka, Hidehiro; Oda, Takaaki; Sato, Fumiyoshi; and Kikuta, Masaaki, 4,422,724, Cl. 350-307.000.

Kilic, Sidika: *See*—
Hammond, Michael J.; and Kilic, Sidika, 4,423,121, Cl. 429-19.000.

Kimura, Hiroshi: *See*—
Minami, Shunji; and Kimura, Hiroshi, 4,422,295, Cl. 60-605.000.

Kimura, Hiroyuki; Ohashi, Shin-ichi; and Nishimura, Keizo, to Hitachi, Ltd. Control apparatus for a recording medium drive motor in a digital information reproducing apparatus. 4,423,498, Cl. 369-47.000.

Kimura, Kenji, to Olympus Optical Co., Ltd. Image pickup apparatus. 4,423,436, Cl. 358-98.000.

Kimura, Masatoshi: *See*—
Imaizumi, Ichiro; Ochi, Shikayuki; Kimura, Masatoshi; Yoshimura, Masayoshi; Yamaguchi, Takashi; and Koda, Toyomasa, 4,423,433, Cl. 357-51.000.

Kimura, Ryoji: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Kimura, Ryoji, 4,423,174, Cl. 524-99.000.

Kimura, Tomohiko: *See*—
Araki, Kazuhiko; Ao, Hideki; Aihara, Kenichi; and Kimura, Tomohiko, 4,423,052, Cl. 424-266.000.
King, Derrick O.: *See*—
Braithwaite, John D.; King, Derrick O.; and Williams, Sidney J., 4,422,788, Cl. 401-188.00R.
Kinoshita, Takao: *See*—
Masunaga, Makoto; Kinoshita, Takao; Sakane, Toshio; Tsunekawa, Tokuichi; Hosoe, Kazuya; Amikura, Takashi; and Harigaya, Isao, 4,422,741, Cl. 354-403.000.
Kinsman, Robert G., to Motorola, Inc. Multiple pole bandpass filter having monolithic crystal elements. 4,423,394, Cl. 333-192.000.
Kioritz Corporation: *See*—
Kuwano, Michiyasu, 4,422,523, Cl. 181-211.000.
Kirk, Linton James: *See*—
Jacobs, Keith R., 4,422,553, Cl. 211-74.000.
Kirkley, J. Darrell, to Jog-O-Lite, Inc. Safety light or the like. 4,423,473, Cl. 362-186.000.
Kirkpatrick, Charles R.: *See*—
Bauer, Wayne J.; Dodt, William C.; Kirkpatrick, Charles R.; Rehage, Ted A.; Robinson, Francis L.; and Taylor, William K., 4,423,480, Cl. 364-200.000.
Kirsch, Jerome; and Markow, Edward, to Grumman Aerospace Corporation. Spoiler for fluid turbine diffuser. 4,422,820, Cl. 415-4.000.
Kitamura, Nobuyoshi; Ito, Nobuo; and Takeuchi, Koji, to Ajinomoto Company Incorporated. Halogen-containing resin compositions stabilized by methionine diketopiperazine. 4,423,175, Cl. 524-100.000.
Kitamura, Takashi, to Canon Kabushiki Kaisha. Beam recording apparatus. 4,423,426, Cl. 346-108.000.
Kitsuda, Minoru. Liftable driver's seat for automobiles. 4,422,611, Cl. 248-421.000.
Kiyoshi Miyake: *See*—
Miyake, Kiyoshi; and Miyata, Naoyuki, 4,423,403, Cl. 338-15.000.
Kjeldsen, William R.: *See*—
Thomas, Richard D.; and Kjeldsen, William R., 4,422,316, Cl. 70-456.00R.
Klein, Ernst: *See*—
Scholz, Heinz; Schnitker, Wolfgang; and Klein, Ernst, 4,422,910, Cl. 204-96.000.
Klein, Heinz H., to Dr. Boy GmbH. Hydraulic actuating and locking device. 4,422,294, Cl. 60-565.000.
Klein, L. E., to Harvey Hubbell Incorporated. Pump basin valve and slip joint. 4,422,472, Cl. 137-614.060.
Kleinknecht, Hans P., to RCA Corporation. Automatic photomask alignment system for projection printing. 4,422,763, Cl. 356-356.000.
Kleinschmidt, Peter; Meixner, Hans; and Magori, Valentin, to Siemens Aktiengesellschaft. Positioning element with a piezo-ceramic body. 4,423,347, Cl. 310-331.000.
Klijanowicz, James E.; and Kovacs, Csaba A., to Eastman Kodak Company. Color-forming carboxamidonaphthalene dye precursor and carboximide dye in photographic material and process. 4,423,126, Cl. 430-9.000.
Kline, Leo. Growth promoting compositions for *Lactobacillus sanfrancisco* and method of preparation. 4,423,079, Cl. 426-20.000.
Kling, John E.: *See*—
Murtaugh, J. Barry; Laurin, Dean G.; Kling, John E.; and Woodworth, Archie G., 4,423,005, Cl. 422-61.000.
Klose, Odo, to Prasenta KG Weber & Co. Key holder. 4,422,315, Cl. 70-456.00R.
Kloster, Kenneth D. Shock absorber shroud cutting tool. 4,422,238, Cl. 30-101.000.
Klotz, Helmut: *See*—
Dinger, Hans; and Klotz, Helmut, 4,422,296, Cl. 60-606.000.
Knecht Filterwerke GmbH: *See*—
Gebert, Hans; Loffelhardt, Manfred; and Obernosterer, Gerhard, 4,422,790, Cl. 403-11.000.
Knight, John C.; and Wovcha, Merle G., to Upjohn Company, The. Composition of matter and process. 4,423,146, Cl. 435-55.000.
Knop, Charles M.; and Ostertag, Edward L., to Andrew Corporation. Diagonal-conical horn-reflector antenna. 4,423,422, Cl. 343-786.000.
Knox, Kenneth L., Sr. Variation of fuel vaporizer for internal combustion engine. 4,422,432, Cl. 123-592.000.
Kobayashi, Jiro: *See*—
Abe, Nobutoshi; Kakizaki, Yukio; and Kobayashi, Jiro, 4,422,547, Cl. 206-328.000.
Kobayashi, Masami. Process for direct gold plating of stainless steel. 4,422,906, Cl. 204-34.000.
Kobayashi, Nobuyuki: *See*—
Komoda, Norio; Kobayashi, Nobuyuki; Itoh, Hiroshi; Nishimura, Yozi; and Obara, Shigenobu, 4,422,497, Cl. 165-23.000.
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing phenyl-[3,3,3-trifluoropropyl)phenyl]methane. 4,423,259, Cl. 570-144.000.
Koda, Toyomasa: *See*—
Imaizumi, Ichiro; Ochi, Shikayuki; Kimura, Masatoshi; Yoshimura, Masayoshi; Yamaguchi, Takashi; and Koda, Toyomasa, 4,423,433, Cl. 357-51.000.
Kodama, Katsuo: *See*—
Iwawaki, Akira; Horiuchi, Eiji; Shinya, Sadahiko; Kojima, Kinshiro; Kodama, Katsuo; Kawarata, Kotaro; and Fukase, Hisahiko, 4,422,838, Cl. 425-376.00A.
Kodama, Masayuki; and Makishima, Sadao, to Fuji Jukogyo Kabushiki Kaisha. Transmission apparatus for four-wheel drive motor vehicle. 4,422,520, Cl. 180-247.000.
Koenig, Herbert G.; and Koenig, Margaret E. Needle threading device. 4,422,564, Cl. 223-99.000.
Koenig, Margaret E.: *See*—
Koenig, Herbert G.; and Koenig, Margaret E., 4,422,564, Cl. 223-99.000.
Koester, Eberhard: *See*—
Felleisen, Peter; Mayer, Dieter; Koester, Eberhard; Domas, Friedrich; and Deigner, Paul, 4,423,454, Cl. 360-135.000.
Koguchi, Kenji: *See*—
Murayama, Tomio; Koguchi, Kenji; Takeuchi, Shigehumi; and Tsukioka, Kazumi, 4,423,520, Cl. 375-95.000.
Koike, Norio; Takahara, Takeshi; Shirakawa, Yasuhiro; and Ikari, Kunihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of making picture tube fluorescent screen. 4,423,128, Cl. 430-28.000.
Koizumi, Mitsuyoshi; Akiyama, Nobuyuki; and Oshima, Yoshimasa, to Hitachi, Ltd. Method and apparatus for inspecting specimen surface. 4,423,331, Cl. 250-572.000.
Kojima, Kinshiro: *See*—
Iwawaki, Akira; Horiuchi, Eiji; Shinya, Sadahiko; Kojima, Kinshiro; Kodama, Katsuo; Kawarata, Kotaro; and Fukase, Hisahiko, 4,422,838, Cl. 425-376.00A.
Kojima, Tetsukiko: *See*—
Sugimori, Shigeru; Kojima, Tetsukiko; and Tsuji, Masakazu, 4,422,951, Cl. 252-299.630.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Nakagome, Yukio; Amano, Kitsutaro; Nakai, Taiichiro; Niiro, Yasuhiko; Ejiri, Yoshihiro; Yamamoto, Hitoshi; and Yamazaki, Yoshihiko, 4,427,718, Cl. 350-96.230.
Kolb, Gunter: *See*—
Lobach, Wilfried; Haas, Peter; Kolb, Gunter; Sackmann, Guter; and Probst, Joachim, 4,423,194, Cl. 525-327.600.
Kolodzey, Jurgen; Schoening, Josef; Schwiers, Hans-Georg; and Stracke, Wilfried, to Hochtemperatur-Reaktorbau GmbH. Differential pressure flowmeter for a gas cooled high temperature reactor blower. 4,422,340, Cl. 73-861.630.
Komatsu, Shigeru, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device having two or more semiconductor elements with paired characteristics regularly arranged in a semiconductor substrate. 4,423,434, Cl. 357-51.000.
Komine, Kikuji: *See*—
Onodera, Takashi; Komine, Kikuji; Ohashi, Fumis; and Naito, Tsutomu, 4,422,924, Cl. 208-33.000.
Komiya, Yutaka; and Takeda, Koichi, to Canon Kabushiki Kaisha. Original feed control unit. 4,422,751, Cl. 355-14.0SH.
Komoda, Norio; Kobayashi, Nobuyuki; Itoh, Hiroshi; Nishimura, Yozi; and Obara, Shigenobu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device of controlling the idling speed of an engine. 4,422,497, Cl. 165-23.000.
Kompelien, Arlon D.; and Westley, Curtis E., to Honeywell Inc. Electric motor damper drive with backup power pack. 4,423,364, Cl. 318-440.000.
Kondo, Hideyo; and Touma, Hitoshi, to Canon Kabushiki Kaisha. Electrostatic image holder having insulating overlayer of fluorinated surfactant. 4,423,132, Cl. 430-67.000.
Kondo, Yasuo; Kato, Masanori; and Nakagawa, Mitsuru, to Nippon Soken, Inc. Control system for electric automobile heating apparatus. 4,423,307, Cl. 219-202.000.
Kondou, Tamaiti: *See*—
Ohtomi, Sadayuki; Hirano, Yasutaka; Tangiku, Iturou; and Kondou, Tamaiti, 4,422,531, Cl. 187-20.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Abe, Shunichi; and Akiyama, Mitsuo, 4,422,756, Cl. 355-57.000.
Kawata, Shun, 4,422,750, Cl. 355-3.0DD.
Sugizaki, Tsugio, 4,422,631, Cl. 271-9.000.
Konrad, Charles E.; and Clark, Robert C., deceased (by Clark, Jean B., executrix), to General Electric Company. Electric vehicle current regulating system. 4,423,362, Cl. 318-139.000.
Kopich, Leonard F., to General Motors Corporation. Seat position control mechanism. 4,422,690, Cl. 297-341.000.
Kopolow, Stephen L.; and Chatterjee, Pronoy K., to Personal Products Company. Synthetic superabsorbent fibers. 4,423,184, Cl. 525-57.000.
Koppers Company, Inc.: *See*—
Doerge, Herman P., 4,423,163, Cl. 521-181.000.
Leston, Gerd, 4,423,253, Cl. 568-756.000.
Koreicho, Wladimir: *See*—
Chavany, Jean C.; and Koreicho, Wladimir, 4,422,601, Cl. 244-3.130.
Kornylak, Andrew T., to Kornylak Corporation. Fluid film continuous processing method and apparatus. 4,422,988, Cl. 264-40.300.
Kornylak Corporation: *See*—
Kornylak, Andrew T., 4,422,988, Cl. 264-40.300.
Korosi, Jeno; Lang, Tibor; Andrasi, Ferene; Szekely, Jozsef; Hamori, Tamas; Balogh, Tibor; Ila, Lajos; Goldschmidt, Katalin; Sineger, Eleonora; and Moravcsik, Imre, to Egyt Gyogyszervegyeszeti Gyar. 3,4-Dihydro-5H-2,3-benzodiazepine derivatives and pharmaceutical use thereof. 4,423,044, Cl. 424-244.000.
Kosowski, Zenon V.: *See*—
Smith, Donald L.; Kosowski, Zenon V.; and Marks, Robert R., Jr., 4,422,342, Cl. 73-863.430.
Koszytorz, Gunther, to Siemens Aktiengesellschaft. Housed contact arrangement for a tubular lamp. 4,422,712, Cl. 339-255.00R.
Kotani, Kikuo: *See*—
Nakagawa, Nobuaki; Kotani, Kikuo; Katsuragi, Shigeo; Morita, Kaoru; Ohyama, Kunio; and Noda, Toshiharu, 4,423,034, Cl. 424-85.000.

Koulbasis, Constantin; Ser, Jean-Claude; and N'Guyen, Quang L., to L'Oreal. Emulsions of the water-in-oil type useable as cosmetic supports or pharmaceutical excipients. 4,422,952, Cl. 252-309.000.

Kovacs, Csaba A.: *See*—
Klijanowicz, James E.; and Kovacs, Csaba A., 4,423,126, Cl. 430-9.000.

Kovalenko, Vitaly I.: *See*—
Nikolaev, Nikolai I.; Tereschenko, Lev A.; Yalovlev, Arian M.; Kovalenko, Vitaly I.; Tatevosian, Ruben A.; Titov, Mikhail Y.; and Lipatov, Nikolai K., 4,422,876, Cl. 106-104.000.

Kowalczyk, Dennis C.; Bricklemyer, Bruce A.; and Svoboda, Joseph J., to Pittsburg & Midway Coal Mining Co., The. Process for removing polymer-forming impurities from naphtha fraction. 4,422,927, Cl. 208-211.000.

Kozaki, Shuichi; Funada, Fumiaki; Minezaki, Shigehiro; and Uede, Hisashi, to Sharp Kabushiki Kaisha. Liquid cryrtal display device and the manufacturing method thereof. 4,422,730, Cl. 350-339.00R.

Kozuka, Michihiro; and Tonokura, Masayuki, to Tomy Kogyo Co., Inc. Toy capable of pivotal movement on a support surface. 4,422,261, Cl. 46-104.000.

Kraemer, John F.: *See*—
Seeney, Charles E.; Kraemer, John F.; and Ingebrigtsen, Janis, 4,422,496, Cl. 164-528.000.

Kraft, Inc.: *See*—
Bauernfeind, John; Carnahan, Russell W.; Lodal, Norman; and Vazquez, Domingo, 4,423,082, Cl. 426-557.000.

Krajewski, Zdzistaw A. A., to Bayly Engineering Limited. Cancellation of group delay error by dual speed of rotation. 4,423,420, Cl. 343-400.000.

Kraus, Charles E., to Excelermatic Inc. Traction roller transmission. 4,422,351, Cl. 74-798.000.

Krauss-Maffei Aktiengesellschaft: *See*—
Seit, Horst, 4,422,696, Cl. 305-28.000.

Kravath, Ricahrd E. Partitioning device and method for pools. 4,422,193, Cl. 4-505.000.

Kravath, Richard E., to Montefiore Hospital and Medical Center, Inc. Method and apparatus for detecting respiratory distress. 4,422,458, Cl. 128-671.000.

Krenz, Horst M., to Heath Company. Grounded multi-pin connector for shielded flat cable. 4,422,700, Cl. 339-14.00R.

Krieg, Gunther: *See*—
Becker, Erwin-Willy; Ehrfeld, Wolfgang; Krieg, Gunther; and Bier, Wilhelm, 4,422,905, Cl. 204-9.000.

Krock, Friedrich W.; and Neeff, Rutger, to Bayer Aktiengesellschaft. Process for the preparation of 1,4-diamino-2,3-dicyano-anthraquinone. 4,422,973, Cl. 260-382.000.

Krueger, Donald G.: *See*—
Dashnier, Merwin J.; Diring, James A.; and Krueger, Donald G., 4,422,584, Cl. 242-55.300.
Schultz, Arthur N.; Diring, James A.; and Krueger, Donald G., 4,422,585, Cl. 242-55.530.

Krumm, Klaus-Dieter, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch, especially for motor vehicles. 4,422,538, Cl. 192-70.140.

Kruth, Jeffrey A.: *See*—
Freitag, Ronald G.; and Kruth, Jeffrey A., 4,423,393, Cl. 333-164.000.

Kubota, Naohiro: *See*—
Minagawa, Motonobu; Kubota, Nsohiro; and Kimura, Ryoji, 4,423,174, Cl. 524-99.000.

Kulesh, Vladimir P.: *See*—
Gribanov, Dmitry D.; Kulesh, Vladimir P.; Martynov, Apollinary K.; Orlov, Anatoly A.; Sidorov, Alexandr I.; Fonov, Sergei D.; and Stepanov, Arkady V., 4,422,737, Cl. 352-39.000.

Kulicke and Soffa Industries, Inc.: *See*—
Elles, Richard J.; Ely, Razon; and Vilenski, Dan, 4,422,568, Cl. 228-111.000.

Kulprathipanja, Santi, to UOP Inc. Separation of bi-alkyl substituted monocyclic aromatic isomers with pyrolyzed adsorbent. 4,423,279, Cl. 585-828.000.

Kumadaki, Itsumaro: *See*—
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,423,259, Cl. 570-144.000.

Kumei, Hiroshi: *See*—
Saito, Takashi; and Kumei, Hiroshi, 4,423,504, Cl. 369-292.000.

Kunz, Walter: *See*—
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Kurahashi Keizo: *See*—
Sato, Sei; Wakitani, Masayuki; Oki, Kenichi; Miura, Shoshin; Yamaguchi, Hisashi; Miyashita, Yoshinori; Shinoda, Tsutae; Yoshikawa, Kazuo; Kurahashi Keizo; and Kawada, Toyoshi, 4,423,356, Cl. 315-169.200.

Kurata, Chikatoshi: *See*—
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Salmon, Michel, 4,423,081, Cl. 426-271.000.

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Lang, Tibor: *See*—
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Lapp, Michael L. Matchlock convertor. 4,422,255, Cl. 42-69.00R.

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Larsen, Mogens D. Apparatus for advancing a predetermined length of strip-shaped material. 4,422,357, Cl. 83-210.000.

Larson, Ted. Garment attachment including openable enclosure. 4,422,306, Cl. 63-1.00R.

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Murtaugh, J. Barry; Laurin, Dean G.; Kling, John E.; and Woodworth, Archie G., 4,423,005, Cl. 422-61.000.

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construction for use in anchoring a surface platform to a sea bed. 4,422,791, Cl. 403-39.000.
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La Volpa, Joseph R. Fipple type headjoint assembly for use with existing transverse flutes. 4,422,364, Cl. 84-384.000.
Lawson, John E., to Armco Inc. Remotely operated valve. 4,422,618, Cl. 251-58.000.
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Lawter, Raymond L.; Wills, David C.; and Singh, Narinder, to NCR Corporation. Record member feed and support mechanism. 4,422,782, Cl. 400-56.000.
Lazar, Warren G. Method for removing cyanoacrylate adhesives from surfaces. 4,422,883, Cl. 134-38.000.
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Jackson, Leon D.; and Morris, Dan O., 4,423,460, Cl. 361-151.000.
Lea, John D.: *See*—
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Leboeuf, William E., to Dow Chemical Company, The. Adjustable slitter blade holder. 4,422,359, Cl. 83-546.000.
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Roger, Renoulin; and Le Brun, Jean Y., 4,423,507, Cl. 370-89.000.
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Ledford, Thomas H.; and Lerner, Howard, to Exxon Research and Engineering Co. Degassing molten sulfur. 4,423,025, Cl. 423-578.00R.
Ledouble, Jean-Pierre; and Tschopp, Markus, to Ciba-Geigy Corporation. Process for the production of O,O-dialkylphosphorodithioates. 4,423,220, Cl. 546-22.000.
Lee, Gim F., Jr., to General Electric Company. Molding compositions comprising polyphenylene ether, polysulfone and vinyl aromatic-diene block copolymer. 4,423,176, Cl. 524-153.000.
Lee, Sam S.: *See*—
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Lee, Young-Jin, to Union Carbide Corporation. Process for preparing 2,5-dichloro-3-nitrobenzoic acid from 2,5-dichloro-3-nitro-p-xylene. 4,423,245, Cl. 562-416.000.
Lee, Yue-Guey L., to General Electric Company. Polyetherimide resin and electrical conductors insulated therewith. 4,423,111, Cl. 428-383.000.
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Lemercier, Guy. Thermal insulation device. 4,423,003, Cl. 376-290.000.
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Leon, Robert L., to Franklin Institute, The. Method and apparatus for detecting and identifying excessively vibrating blades of a turbomachine. 4,422,333, Cl. 73-660.000.
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Berginski, Werner-Ernst, 4,423,297, Cl. 200-61.540.
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Leston, Gerd, to Koppers Company, Inc. Process for separating t-butylated phenols. 4,423,253, Cl. 568-756.000.
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Kemper, Hermanus C.; and Versluis, Pieter, 4,422,950, Cl. 252-186.380.
Levi, Kurt L. Index sheet. 4,422,672, Cl. 283-39.000.
Lewis, David F.; and Kaplin, Edward J., to York Research Corporation. Effluent detection methods. 4,423,152, Cl. 436-56.000.
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Lichti, Robert D. Mechanized retrievable horizontal storage rack. 4,422,554, Cl. 211-1.500.
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Limburg, William W.; Pochan, John M.; and Beatty, Charles L., to Xerox Corporation. Photoresponsive devices containing polyvinylsilicate costings. 4,423,131, Cl. 430-59.000.
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Lisec, Peter. Apparatus for conveying insulating glass panes. 4,422,541, Cl. 198-627.000.
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Little, Frank, to Harshaw Chemical Company, The. Metal finishing barrel apparatus. 4,422,774, Cl. 366-347.000.
Little, Frank, to Harshaw Chemical Company, The. Load manipulating apparatus. 4,422,817, Cl. 414-421.000.
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Loney, Ann M. Hospital garment. 4,422,186, Cl. 2-114.000.
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Jefferson, John R., 4,422,425, Cl. 123-450.000.
Price, Anthony G., 4,422,533, Cl. 188-71.400.

Luchessa, Charles E.; and Brown, Timothy E., to Sierra Misco. Liquid level sensor. 4,422,328, Cl. 73-313.000.

Lugscheider, Walter; Riegler, Ernst; and Zajicek, Ernst, to Voest-Alpine Aktiengesellschaft. Plasma melting furnace. 4,423,512, Cl. 373-22.000.

Luk Lamellen und Kupplungsbau GmbH: *See*—
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MacChesney, John B.; O'Connor, Paul B.; and Sullivan, Miles V., to Bell Telephone Laboratories, Incorporated. Technique for the fabrication of an iron oxide mask. 4,422,898, Cl. 156-655.000.

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Mahn, John E. Laminated material and method of forming. 4,423,106, Cl. 428-207.000.

Maida, Osamu, to Nippon Kogaku K.K. Apparatus for signal transmission and reception between camera and attachment. 4,422,744, Cl. 354-413.000.

Maier, Peter; and Tschacher, Hans-Dieter. Powered handtool. 4,422,239, Cl. 30-124.000.

Maillard, Jacques G.; Delaunay, Perre P. A.; and Legeoi, Jacky M. G., to Laboratoires Jacques Logeais. 5(Aminomethyl)-4,5,6,7-tetrahydro[d]thiazole containing compositions for and medical use in treating circulatory insufficiencies. 4,423,056, Cl. 424-270.000.

Main, Brian: *See*—
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Maiocco, Giuseppe A.; and Vidoni, Sergio, to Champion Spark Plug Italiana S.p.A. Plastic wiper blade. 4,422,207, Cl. 15-250.420.

Maire, Aurele; and Perucchi, Norbert, to Compagnie des Montres Longines, Francillon S.A. Device for correction of time date displayed by an electronic watch. 4,422,776, Cl. 368-185.000.

Maki, Takao; Masuyama, Tetsuo; Yokoyama, Toshiharu; and Fujiyama, Yoshiko, to Mitsubishi Chemical Industries Limited. Process for preparing bisphenols. 4,423,252, Cl. 568-728.000.

Makimoto, Mitsuo; and Yamashita, Sadahiko, to Matsushita Electric Industrial Company, Limited. Bandpass filter for UHF band. 4,423,396, Cl. 333-204.000.

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Malcolm, Michael A.: *See*—
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Malvasio, William A. Invertible floor brooen. 4,422,202, Cl. 15-106.000.

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Mandich, George E. Split collar spacer ring assembly. 4,422,793, Cl. 403-261.000.

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Marcoz, Jean A. E. Control device to be mounted in a frame for operating the displacement of an arm and use of the device in particular as a switch. 4,423,400, Cl. 337-72.000.

Marder, William Z.: *See*—
Reid-Green, Keith S.; and Marder, William Z., 4,423,481, Cl. 364-474.000.

Marecki, Paul E.; and Weaver, John M., to SDS Biotech Corporation. 4-Me-1-(2-(1H-tetrazol-5-yl)ethyl)benzene sulfonate and N-2-(1H-tetrazol-5-yl)ethyl methanesulfonamide. 4,423,224, Cl. 548-252.000.

Maret, Jean C., to Aciers et Outillage Peugeot. Trimming machine. 4,422,486, Cl. 144-117.00R.

Marino, Joseph A.; and Roth, Sydney J., to Bear Automotive Service Equipment Company. Automotive battery test apparatus. 4,423,378, Cl. 324-427.000.

Marinoni, Mario, to Casma di Vi Marinoni & Figli. Door closer shaft. 4,422,213, Cl. 16-71.000.

Marion, Roland M.: *See*—
Bitting, Ricky F.; and Marion, Roland M., 4,423,442, Cl. 360-68.000.

Markow, Edward: *See*—
Kirsch, Jerome; and Markow, Edward, 4,422,820, Cl. 415-4.000.

Marks, Robert R., Jr.: *See*—
Smith, Donald L.; Kosowski, Zenon V.; and Marks, Robert R., Jr., 4,422,342, Cl. 73-863.430.

Marley/Wylain Company, The: *See*—
LaGrange, Nyle D.; and Deters, Elmer M., 4,422,469, Cl. 137-315.000.

Marrel, Jean-Francois: *See*—
Duc, Laurent; Boosen, Karl-Josef; and Marrel, Jean-Francois, 4,423,217, Cl. 544-267.000.

Marshall, James F.: *See*—
Buxe, Paul M.; Marshall, James F.; and Smith, Paul A., Jr., 4,422,827, Cl. 416-193.00A.

Marsland, Henryk: *See*—
Bergsand, Arne; and Marsland, Henryk, 4,422,210, Cl. 15-302.000.

Martin, Jean: *See*—
Wiart, Albert; Defaucheux, Jacques; Pasqualini, Gilbert; and Martin, Jean, 4,423,002, Cl. 376-227.000.

Martin, John C.: *See*—
Verheyden, Julien P. H.; and Martin, John C., 4,423,050, Cl. 424-253.000.

Martin, Michel: *See*—
Dubuis, Jean-Charles; Martin, Michel; Piaget, Bernard; Piquard, Jean-Francois; and Vacher, Jacques, 4,422,332, Cl. 73-625.000.

Martynov, Apollinary K.: *See*—
Gribanov, Dmitry D.; Kulesh, Vladimir P.; Martynov, Apollinary K.; Orlov, Anatoly A.; Sidorov, Alexandr I.; Fonov, Sergei D.; and Stepanov, Arkady V., 4,422,737, Cl. 352-39.000.

Marvin Glass & Associates: *See*—
Holahan, Edward T.; and Disko, Harry, 4,422,644, Cl. 273-249.000.

Marx, Michael: *See*—
Li, Tsung-tee; and Marx, Michael, 4,423,068, Cl. 424-305.000.

Marz, Horst F., to C-I-L Inc. Explosive container of interconnected thermoplastic film packages. 4,422,382, Cl. 102-331.000.

Mason, Lawrence J.: *See*—
Bullock, Randolph A.; and Mason, Lawrence J., 4,423,478, Cl. 363-89.000.

Masonite Corporation: *See*—
Janiga, Eugene R., 4,423,173, Cl. 524-14.000.
Slocum, Donald H.; and Eaton, James W., 4,422,266, Cl. 52-58.000.

Massachusetts Institute of Technology: *See*—
Haven, Richard E.; and Suh, Nam P., 4,423,191, Cl. 525-169.000.
Horwitz, Christopher M., 4,422,897, Cl. 156-643.000.
Senturia, Stephen D.; and Garverick, Steven L., 4,423,371, Cl. 324-61.00R.

Masters, Ian M.: *See*—
Weir, Donald R.; Masters, Ian M.; and Neven, Manfred, 4,423,007, Cl. 423-2.000.

Masto Wireservice A/S: *See*—
Johansen, Steinar, 4,422,529, Cl. 184-15.00R.

Masubuchi, Hiroshi, to Tonka Corporation. Gear changing mechanism for toy vehicle driving devices. 4,422,263, Cl. 46-209.000.

Masuda, Yoshinori, to Asahi Kasei Kogyo Kabushiki Kaisha. Fluorinated cation exchange membrane. 4,423,157, Cl. 521-27.000.

Masugi, Takashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,423,213, Cl. 544-16.000.

Masumoto, Yuuji: *See*—
Nishimura, Tomio; Yoshino, Hiraku; Takao, Kosei; and Masumoto, Yuuji, 4,422,874, Cl. 75-238.000.

Masunaga, Makoto; Kinoshita, Takao; Sakane, Toshio; Tsunekawa, Tokuichi; Hosoe, Kazuya; Amikura, Takashi; and Harigaya, Isao, to Canon Kabushiki Kaisha. Distance detecting device and a focus control system utilizing the same. 4,422,741, Cl. 354-403.000.

Masuyama, Tetsuo: *See*—
Maki, Takao; Masuyama, Tetsuo; Yokoyama, Toshiharu; and Fujiyama, Yoshiko, 4,423,252, Cl. 568-728.000.

Materials Research Corporation: *See*—
Class, Walter H.; Hurwitt, Steven D.; Hill, Michael L.; and Hutt, Marvin K., 4,422,896, Cl. 156-643.000.

Mathias, Emily A. Teaching aid and process for teaching. 4,422,852, Cl. 434-178.000.

Matson, Stephen L.: *See*—
Flock, John W.; Matson, Stephen L.; and Bollenbeck, Peter H., 4,423,207, Cl. 528-499.000.

Matsui, Masakuni: *See*—
Tsugekawa, Takanori; Banba, Tosio; and Matsui, Masakuni, 4,422,426, Cl. 123-470.000.

Matsumoto, Gohichi; and Hayakawa, Yohichi, to Aisin Warner Kabushiki Kaisha. Torque transfer device for a four wheel drive vehicle. 4,422,349, Cl. 74-665.0GE.

Matsumoto, Koichi; Katayama, Yoshihiko; and Sakurai, Hisaya, to Asahi Kasei Kogyo Kabushiki Kaisha. Thermoplastic resinous composition. 4,423,185, Cl. 525-66.000.

Matsumoto, Toshiaki: *See*—
Izumi, Tatsuro; Taniguchi, Nobuyuki; Matsumoto, Toshiaki; Niwa, Masatake; Ishida, Tokuji; and Itoh, Masatoshi, 4,422,743, Cl. 354-415.000.

Matsuo, Noritaka; Takeuchi, Koichiro; and Muramatsu, Tokuji, to Yamaha Motor Co., Ltd. Intake system of engines. 4,422,415, Cl. 123-52.00M.

Matsushita Electric Industrial Co., Ltd.: *See*—
Danno, Tsuneo; Kanno, Masashi; and Murata, Eiichiro, 4,423,517, Cl. 375-1.000.
Makinoto, Mitsuo; and Yamashita, Sadahiko, 4,423,396, Cl. 333-204.000.

Matsushita Electric Works, Ltd.: *See*—
Hamabe, Takafumi, 4,422,449, Cl. 128-44.000.
Sugai, Haruo; Hamabe, Takafumi; Yamamura, Yukio; Otuka, Shinpei; and Moriwaki, Hiroshi, 4,422,448, Cl. 128-44.000.

Matsushita Electronics Corporation: *See*—
Ogata, Yoshiro; Yamazaki, Haruo; Ikeda, Takashi; and Akutsu, Hidezoh, 4,423,353, Cl. 313-631.000.

Mattel, Inc.: *See*—
Del Principe, Robert M.; and Oliphant, Peter A., 4,422,639, Cl. 273-94.000.

Matth. Hohner AG: *See*—
Deforeit, Christian J., 4,422,363, Cl. 84-1.260.

Mattingly, Denis A. E., to Bernard Strutt Agencies Limited. Apparatus for magnetic treatment of water of other liquids. 4,422,935, Cl. 210-223.000.

Matuda, Sigeyaki: *See*—
Fujihiro, Sanae; and Matuda, Sigeyaki, 4,422,278, Cl. 52-714.000.

Matushita Electronics Corporation: *See*—
Ogata, Yoshiro; Yamazaki, Haruo; and Akutsu, Hidezoh, 4,423,350, Cl. 313-493.000.

Maucher, Hans; Zanner, Georg; and Repa, Otto, to Carl Walther GmbH. Adjustable cheek-piece for a shoulder firearm. 4,422,256, Cl. 42-73.000.

Maupin, Phillip E.: *See*—
Cray, Nicholas K.; Murrin, Frederick L.; and Maupin, Phillip E., 4,422,613, Cl. 248-473.000.

Maurel, Pierre; and Nicolas, Francois, to Aluminium Pechiney. Carbonate, sulphate and hydroxide or hydrogen carbonate. 4,423,009, Cl. 423-15.000.

Maurel, Pierre, to Aluminium Pechiney. Process for the selective removal of arsenic in the course of the oxidizing attack by means of a carbonated liquor on a uraniferous ore containing same. 4,423,010, Cl. 423-15.000.

Maurel, Pierre; and Nicolas, Francois, to Aluminium Pechiney. Process for the purification of solutions containing alkali metal carbonate, sulphate, hydroxide or possibly hydrogen carbonate, and one at least of the metals vanadium, uranium and molybdenum. 4,423,013, Cl. 423-55.000.

Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Combating pests with novel pyrazol-4-yl N-alkylcarbamates. 4,423,058, Cl. 424-273.00P.

Maurer, Helmut: *See*—
Linder, Ernst; Maurer, Helmut; and Muller, Klaus, 4,422,323, Cl. 73-116.000.

Mauser-Werke GmbH: *See*—
Przytulla, Dietmar; and Lehmann, Manfred, 4,422,839, Cl. 425-465.000.

Maxelon, Rainer: *See*—
Wirtz, Gerhard; and Maxelon, Rainer, 4,422,923, Cl. 208-33.000.

Maxner, Richard B.; and Bandura, Vitaly, to USM Corporation. Wire feeder. 4,422,583, Cl. 242-45.000.

Maxwell, Kameron W.: *See*—
Simon, Lionel N.; and Maxwell, Kameron W., 4,423,027, Cl. 424-16.000.

Mayco Wellchem, Inc.: *See*—
Corley, Wallace T.; and Dorsey, David L., 4,422,948, Cl. 252-8.5LC.
Dorsey, David L.; and Corley, Wallace T., 4,422,947, Cl. 252-8.50C.

Mayer, Dieter: *See*—
Felleisen, Peter; Mayer, Dieter; Koester, Eberhard; Domas, Friedrich; and Deigner, Paul, 4,423,454, Cl. 360-135.000.

Mayland, Kenneth: *See*—
Vickers, David P.; Mayland, Kenneth; and Allan, Gordon K., 4,422,884, Cl. 148-2.000.

Mays, Robert K.: *See*—
Wason, Satish K.; and Mays, Robert K., 4,422,880, Cl. 106-288.00B.

Mazin, Moshe: *See*—
Stewart, Roger G.; and Mazin, Moshe, 4,423,432, Cl. 357-45.000.

McAllister, Ian R.; Buist, Ian A.; and Pistruzak, William M. Fire resistant oil spill control boom. 4,422,797, Cl. 405-70.000.

McAlpine, James B.; and Carney, Ronald E., to Abbott Laboratories. Intermediates for the preparation of 3-demethoxyfortimicins. 4,423,210, Cl. 536-16.100.

McCall, Kenneth E.: *See*—
Johnson, David E.; McCall, Kenneth E.; and Coughlin, William J., 4,422,384, Cl. 105-29.00R.

McClure, Don W., to Rockwell International Corporation. Simulated wire wheel trim for automobile wheels. 4,422,692, Cl. 301-37.0SS.

McCombie, Stuart W., to Schering Corporation. 6-Substituted-hydrocarbon-2-(substituted-thio)penem-3-carboxylic acids. 4,423,055, Cl. 424-270.000.

McCrory, Roy E. Carrousel wildfowl decoy. 4,422,257, Cl. 43-3.000.

McCullough, Glenn R.: *See*—
Hardesty, Donald E.; and McCullough, Glenn R., 4,422,246, Cl. 34-9.000.

McCurdy, Gerald D., to Coe Manufacturing Company, The. Multi-dog log carriage. 4,422,487, Cl. 144-245.00R.

McDermott Incorporated: *See*—
Green, William L.; Calkins, Dennis E.; Harrison, Gary E.; and Wilkins, Jesse R., 4,422,799, Cl. 405-158.000.

McEuen, Brent E.: *See*—
Dunham, H. E.; Arana, David; Jackson, Terrell D.; McEuen, Brent E.; and Schneider, John A., 4,422,624, Cl. 266-182.000.

McFadden, Bertram W.: *See*—
Hayashigawa, Lawrence; and McFadden, Bertram W., 4,422,851, Cl. 434-45.000.

McGee, William R., to Consolidated Technology Corporation. Apparatus and method for safely purifying hydrogen gas. 4,422,859, Cl. 55-16.000.

McGlothlin, Quentin T.; and O'Brien, Barry M., to Exxon Research & Engineering Co. Silica flotation collectors derived from isononyl alcohol. 4,422,928, Cl. 209-166.000.

McGraw-Edison Company: *See*—
Iverson, James R.; Tell, Ernest L.; and Pinotti, Terry L., 4,423,336, Cl. 307-64.000.

McGuire, S. E.: *See*—
Yang, Kang; Reedy, James D.; McGuire, S. E.; and Kerfoot, O. C., 4,423,278, Cl. 585-823.000.

McJunkin Corporation: *See*—
Gall, Adam F.; and McJunkin, Howard P., Jr., 4,422,339, Cl. 73-861.610.

McJunkin, Howard P., Jr.: *See*—
Gall, Adam F.; and McJunkin, Howard P., Jr., 4,422,339, Cl. 73-861.610.

McKay, Nicholas D., to Helmac Products Corporation. Lint remover. 4,422,201, Cl. 15-104.00A.

McKee, James E. Fluid operated diaphragm pump with fluid timing control and control circuit manifold mounted on pump body. 4,422,835, Cl. 417-401.000.

McKelvey, Harold E., to Shatterproof Glass Corporation. Magnetron cathode sputtering apparatus. 4,422,916, Cl. 204-192.00R.

McManus, Henry E. Flexible reflector assembly for bicycles and the like. 4,422,615, Cl. 248-475.00R.

McMillen, Graham T.: *See*—
Moorby, Donald G.; McMillen, Graham T.; and Flemons, Ralph S., 4,422,320, Cl. 73-12.000.

McPherson, Bruce M., to NCR Corporation. Encoded card reader. 4,423,320, Cl. 235-482.000.

McQueen, Sidney J. Safety mechanism for firearms. 4,422,254, Cl. 42-1.00Y.

McQuillan, Charles M.: *See*—
Cromas, Joseph C.; and McQuillan, Charles M., 4,422,420, Cl. 123-352.000.
McSparran, Joseph F., to RCA Corporation. Shock and vibration resistant electrical switch. 4,423,296, Cl. 200-67.00A.
Mead Johnson & Company: *See*—
Temple, Davis L., Jr., 4,423,049, Cl. 424-251.000.
Mechanical Technology Incorporated: *See*—
Berntell, John O., 4,422,291, Cl. 60-517.000.
Howarth, Roy B., 4,422,649, Cl. 277-75.000.
Medical Specialties, Inc.: *See*—
English, Paul R., 4,422,454, Cl. 128-134.000.
Medtronic, Inc.: *See*—
Zaidenweber, Gary A., 4,423,456, Cl. 361-77.000.
Meeker, David M., to Champion International Corporation. Mark locator and method of using same. 4,422,241, Cl. 33-1.0BB.
Megapulse Incorporated: *See*—
Johannessen, Paul R., 4,423,419, Cl. 343-387.000.
Meginniss, Stephen M., III: *See*—
Groenewegen, Johannes B.; and Meginniss, Stephen M., III, 4,422,598, Cl. 242-192.000.
Meguro, Hiroshi; and Okabe, Nobuo, to Nippon Kogaku K.K. Auto focus camera. 4,422,746, Cl. 354-195.120.
Meixner, Hans: *See*—
Kleinschmidt, Peter; Meixner, Hans; and Magori, Valentin, 4,423,347, Cl. 310-331.000.
Melby, Earl G.; Cocain, Harry W.; and Fabris, Hubert J., to General Tire & Rubber Company, The. Dehydrochlorination of vinyl chloride resins followed by graft copolymerization with copolymerizable monomers. 4,423,193, Cl. 525-296.000.
Mellen, Robert H., Sr. Dynamic gradient furnace with controlled heat dissipation. 4,423,516, Cl. 373-111.000.
Mercer, Roger W., II. Prosthetic horseshoe. 4,422,509, Cl. 168-4.000.
Merchants Metals, Inc.: *See*—
Broski, Stanley M., Jr., 4,422,622, Cl. 256-25.000.
Merck & Co., Inc.: *See*—
Bagner, Carl; and Wildman, Arthur S., 4,423,211, Cl. 536-16.900.
Mrozik, Helmut H., 4,423,209, Cl. 536-7.100.
Rooney, Clarence S.; Williams, Haydn W. R.; Gragoe, Edward J., Jr.; and Patchett, Arthur A., 4,423,063, Cl. 424-278.000.
Merger, Franz; and Schroff, Ludwig, deceased (by Schroff, Meinie Thea, heiress), to BASF Aktiengesellschaft. Manufacture of aralkylarylamines and alkylarylamines. 4,423,247, Cl. 564-391.000.
Merrell Toraude et Compagnie: *See*—
Gerhart, Fritz; and Van Dorsselaer, Viviane, 4,423,073, Cl. 424-314.000.
Mertin, Dietrich; Derner, Paul; and von Reis, Wolf, to BFG Glassgroup. Insulating glass unit. 4,422,280, Cl. 52-788.000.
Messerschmitt-Boelkow-Blohm GmbH: *See*—
Schmidt, Helmut; Ramm, Ulrich; and Schroeder, Alexander, 4,422,627, Cl. 267-148.000.
Messick, John R.; Ackley, William R.; and Moon, George D., Jr., to Raphael Katzen Associates International Inc. Anhydrous ethanol distillation method and apparatus. 4,422,903, Cl. 203-19.000.
Messier-Hispano-Bugatti (S.A.): *See*—
Turiot, Andre, 4,422,602, Cl. 244-102.00R.
Turiot, Andre; and Derrien, Michel, 4,422,603, Cl. 244-102.00R.
Turiot, Andre; and Derrien, Michel, 4,422,604, Cl. 244-102.00R.
Met-Con Manufacturing: *See*—
Pederson, Jeffrey W., 4,422,413, Cl. 123-25.00J.
Metaalwarenfabriek Venlo B.V.: *See*—
Holthuisen, Arnoldus G., 4,422,769, Cl. 366-178.000.
Meyer, John W.: *See*—
Bonin, John H.; Meyer, John W.; and Daniel, Arnold D., Jr., 4,422,809, Cl. 406-98.000.
Meyman, Usher. Rotary machine with peripherally contacting rotors and end face sealing plate. 4,422,836, Cl. 418-56.000.
Michel, Rudolph H., to Du Pont de Nemours, E. I., and Company. Extruder process for preparation of carbon fiber reinforced fluoropolymer compositions. 4,422,992, Cl. 264-108.000.
Micro Motion, Inc.: *See*—
Smith, James E., 4,422,338, Cl. 73-861.380.
Micronic AB: *See*—
Jacobsen, Hans, 4,423,319, Cl. 235-472.000.
Midorikawa, Akira: *See*—
Miyakawa, Seiichi; Midorikawa, Akira; Aniyama, Kenzo; and Tatsumi, Susumu, 4,423,134, Cl. 430-103.000.
Midwest Cut Stone Co.: *See*—
Baetje, Kenneth J., 4,422,275, Cl. 52-509.000.
Milciunas, Juan: *See*—
Gatto, Donald F.; and Milciunas, Juan, 4,423,468, Cl. 361-404.000.
Millanta, Luigi: *See*—
Bini, Marco; Ignesti, Amleto; Millanta, Luigi; Rubino, Nicola; and Vanni, Riccardo, 4,423,372, Cl. 324-72.000.
Miller, Brian T.: *See*—
Hunt, Roger W.; Miller, Brian T.; and Schroeder, Donald R., 4,422,226, Cl. 29-25.350.
Miller, David L. W.; and Freeman, Billy P., to Free Flow, Inc. Pneumatic transfer system and a fluid flow control device therefor. 4,422,833, Cl. 417-183.000.
Miller, Stephen J., to Chevron Research Company. Low pressure oligomerization of gaseous olefins. 4,423,268, Cl. 585-533.000.
Miller, Stephen J., to Chevron Research Company. Oligomerization of gaseous olefins. 4,423,269, Cl. 585-533.000.
Miller, Wendell R., to Quantum Systems Corporation. Backwashing-type filtering apparatus. 4,422,938, Cl. 210-411.000.
Miller, William D.: *See*—
Roeger, Carl R.; Miller, William D.; and Goodin, Charles R., 4,422,582, Cl. 241-82.500.
Milleron, Norman. Rotating fiber array molecular driver and molecular momentum transfer device constructed therewith. 4,422,822, Cl. 415-90.000.
Milliman, Keith, to Coleman Company, Inc., The. Projectile loader and detent assembly for guns. 4,422,433, Cl. 124-74.000.
Minagawa, Motonobu; Kubota, Naohiro; and Kimura, Ryoji, to Adeka Argus Chemical Co., Ltd. Synthetic resin compositions containing 2,2,6,6-tetramethyl piperidyl ethers. 4,423,174, Cl. 524-99.000.
Minami, Shunji; and Kimura, Hiroshi, to Yamaha Motor Co., Ltd. Lubricating system for turbo-chargers. 4,422,295, Cl. 60-605.000.
Minaskanian, Gevork: *See*—
Rajadhyaksha, Vithal J.; Peck, James V.; and Minaskanian, Gevork, 4,422,970, Cl. 260-239.30R.
Minezaki, Shigehiro: *See*—
Kozaki, Shuichi; Funada, Fumiaki; Minezaki, Shigehiro; and Uede, Hisashi, 4,422,730, Cl. 350-339.00R.
Minilite Limited: *See*—
Power, Derek J., 4,422,490, Cl. 152-394.000.
Minisci, Francesco; Serboli, Giancarlo; and Platone, Edoardo, to ANIC, S.p.A. Process for the side-chain polyhalogenation of polyalkylaromatic hydrocarbons. 4,423,263, Cl. 570-197.000.
Ministry of International Trade & Industry: *See*—
Kikuchi, Keisuke; Morikawa, Takitaro; Shimada, Junichi; and Sakurai, Kenjiro, 4,422,733, Cl. 350-413.000.
Nakano, Eiji, 4,423,406, Cl. 338-32.00R.
Minnesota Mining and Manufacturing Company: *See*—
Behr, Fred E., 4,423,197, Cl. 526-220.000.
Isbrandt, Russell R.; and Lowrey, Robert D., 4,423,139, Cl. 430-338.000.
Minolta Camera Kabushiki Kaisha: *See*—
Izumi, Tatsuro; Taniguchi, Nobuyuki; Matsumoto, Toshiaki; Niwa, Masatake; Ishida, Tokuji; and Itoh, Masatoshi, 4,422,743, Cl. 354-415.000.
Miquel, Jean: *See*—
Juguin, Bernard; Cosyns, Jean; and Miquel, Jean, 4,423,264, Cl. 585-255.000.
Miro, Nemesio D.: *See*—
Kaus, Malcolm J.; and Miro, Nemesio D., 4,422,957, Cl. 502-177.000.
Mitani Electronics Industry Corp.: *See*—
Miyazaki, Toshikiyo; Miura, Ushio; and Hatanaka, Masahiro, 4,423,352, Cl. 313-584.000.
Mitchell, Howard L., to Exxon Research and Engineering Co. Organic salt compositions in extraction processes. 4,422,975, Cl. 260-448.0AD.
Mitchell, Peter R. Thermoforming tubular articles. 4,422,999, Cl. 264-339.000.
Mitsubishi Chemical Industries Limited: *See*—
Maki, Takao; Masuyama, Tetsuo; Yokoyama, Toshiharu; and Fujiyama, Yoshiko, 4,423,252, Cl. 568-728.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Hasegawa, Tadashi, 4,423,449, Cl. 360-106.000.
Hashimoto, Koosuke, 4,423,359, Cl. 318-6.000.
Ohtomi, Sadayuki; Hirano, Yasutaka; Tangiku, Iturou; and Kondou, Tamaiti, 4,422,531, Cl. 187-20.000.
Ozaki, Minoru; Onishi, Ken; and Tanaka, Kunimaro, 4,423,441, Cl. 360-13.000.
Mitsubishi Petrochemical Company Limited: *See*—
Omori, Hiroyuki; Takeda, Makoto; Fujita, Koichi; and Kataoka, Mitsugi, 4,422,981, Cl. 260-465.80D.
Mitsui, Michio: *See*—
Saito, Eiiji; Aizawa, Shoji; Mitsui, Michio; Miyata, Tomohiko; and Kuroda, Masayuki, 4,422,576, Cl. 239-693.000.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Yamamoto, Ryuichi; Takagi, Akinobu; Kataita, Masafumi; Obata, Kenji; and Mori, Shigeki, 4,422,976, Cl. 260-453.0PH.
Mitsuya, Kinpei: *See*—
Arakawa, Hiroshi; and Mitsuya, Kinpei, 4,422,484, Cl. 139-435.000.
Mittelmann, Gerhard; Brodbeck, Klaus P.; and Bretschneider, Gerd, to Swiss Aluminium Ltd. Container for freight transport. 4,422,558, Cl. 220-1.500.
Miura, Shoshin: *See*—
Sato, Sei; Wakitani, Masayuki; Oki, Kenichi; Miura, Shoshin; Yamaguchi, Hisashi; Miyashita, Yoshinori; Shinoda, Tsutae; Yoshikawa, Kazuo; Kurahashi Keizo; and Kawada, Toyoshi, 4,423,356, Cl. 315-169.200.
Miura, Ushio: *See*—
Miyazaki, Toshikiyo; Miura, Ushio; and Hatanaka, Masahiro, 4,423,352, Cl. 313-584.000.
Miyakawa, Seiichi; Midorikawa, Akira; Aniyama, Kenzo; and Tatsumi, Susumu, to Ricoh Company, Ltd. Developing unit for electrophotography. 4,423,134, Cl. 430-103.000.
Miyake, Kiyoshi; and Miyata, Naoyuki, to Hitachi, Ltd.; and Kiyoshi Miyake. Transparent conductive films and methods of producing same. 4,423,403, Cl. 338-15.000.
Miyake, Sumio: *See*—
Hasegawa, Akira; Shimizu, Ippei; Kaneko Toshio; and Miyake, Sumio, 4,422,670, Cl. 282-27.500.
Miyamoto, Kazuaki: *See*—
Nishizaki, Tomoyoshi; Miyamoto, Minoru; Miyamoto, Kazuaki; Yoshida, Ken; Yamaji, Katuhiko; and Nakata, Yasushi, 4,422,500, Cl. 165-104.120.

Miyamoto, Minoru: *See—*
Nishizaki, Tomoyoshi; Miyamoto, Minoru; Miyamoto, Kazuaki; Yoshida, Ken; Yamaji, Katuhiko; and Nakata, Yasushi, 4,422,500, Cl. 165-104.120.
Miyamoto, Osamu: *See—*
Nakata, Tohru; Endo, Hiroyuki; Harada, Masatoshi; Hayasaka, Tadao; and Miyamoto, Osamu, 4,422,875, Cl. 75-243.000.
Miyashita, Yoshinori: *See—*
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Bell, Weldon K.; and Chang, Clarence D., 4,423,155, Cl. 502-38.000.
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Rollmann, Louis D.; and Valyocsik, Ernest W., 4,423,021, Cl. 423-333.000.
Yan, Tsoung-Yuan, 4,423,008, Cl. 423-7.000.
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Godfrey, Thomas E.; and Moesser, Lovere A., 4,422,758, Cl. 356-152.000.
Mohr, Reinhard; and Neeb, Rudolf, to Hoechst Aktiengesellschaft. Zinc chloride complex compounds. 4,423,22*C*, Cl. 548-402.000.
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Molby, Lloyd A. Scrapper type vehicle. 4,422,818, Cl. 414-712.000.
Monnet, Bernard, to Pont-A-Mousson S.A. Apparatus for injecting plastics and elastomers. 4,422,842, Cl. 425-561.000.
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D'Amico, John J., 4,422,865, Cl. 71-90.000.
Lester, J. Harvey, Jr.; and Danly, Donald E., 4,423,018, Cl. 423-243.000.
Olive, Salvador; and Olive, Gisela, 4,423,113, Cl. 428-389.000.
Renshaw, James T., 4,423,178, Cl. 524-287.000.
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Kravath, Richard E., 4,422,458, Cl. 128-671.000.
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Messick, John R.; Ackley, William R.; and Moon, George D., Jr., 4,422,903, Cl. 203-19.000.
Moorby, Donald G.; McMillen, Graham T.; and Flemons, Ralph S., to Canadian General Electric Company Limited. Wedge tightness measuring device. 4,422,320, Cl. 73-12.000.
Moore, Boyd B. Protective clamp assembly. 4,422,504, Cl. 166-241.000.
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Moore, Junius T., 4,422,556, Cl. 211-119.000.
Moore, James E.: *See—*
Crivello, James V.; and Moore, James E., 4,423,136, Cl. 430-281.000.
Moore, Junius T., to Moore Company, Inc., The. Receptacles for overhead storage systems. 4,422,556, Cl. 211-119.000.
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Morgan, Frederick R., to Radiant Tube Systems Limited. Heating system. 4,422,573, Cl. 237-70.000.
Morgan, George W., to Suncor, Inc. Means for increasing the efficiency of an ice disaggregation system. 4,422,399, Cl. 114-42.000.
Morgan, Robert H.: *See—*
Charney, Joseph C.; Goodman, Phillip M.; and Morgan, Robert H., 4,422,789, Cl. 401-218.000.
Morganti, Luigi. Roller press. 4,422,375, Cl. 100-210.000.
Mori, Shigeki: *See—*
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Sugai, Haruo; Hamabe, Takafumi; Yamamura, Yukio; Otuka, Shinpei; and Moriwaki, Hiroshi, 4,422,448, Cl. 128-44.000.
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Jackson, Leon D.; and Morris, Dan O., 4,423,460, Cl. 361-151.000.
Morton, Richard G., to Jersey Nuclear-Avco Isotopes, Inc. Unstable waveguide laser resonator. 4,423,511, Cl. 372-95.000.
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Moss, Robert R. Game call having blades of differing height. 4,422,262, Cl. 46-189.000.
Motorola, Inc.: *See—*
Alaspa, Allan A.; and Beutler, Robert R., 4,423,369, Cl. 323-303.000.
Bailey, David F.; Gilmore, Merle L.; Ganucheau, Charles J., Jr.; and Clow, Gary W., 4,423,416, Cl. 340-825.520.
DeBock, Richard M., 4,423,384, Cl. 328-152.000.
Gatto, Donald F.; and Milciunas, Juan, 4,423,468, Cl. 361-404.000.
Kinsman, Robert G., 4,423,394, Cl. 333-192.000.
Seelbach, Walter C.; and Hansen, Boyd K., 4,423,339, Cl. 307-464.000.
Spinks, Brian M., 4,423,340, Cl. 307-530.000.
Motoyuki, Hosokawa: *See—*
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Mowery, Kenneth D.; and Pechous, L. Joseph, to General Motors Corporation. Combined closed loop and anticipating knock limiting spark timing system. 4,422,422, Cl. 123-425.000.
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Hoelderich, Wolfgang; Mross, Wolf D.; and Schwarzmann, Matthias, 4,423,273, Cl. 585-640.000.
Mrozik, Helmut H., to Merck & Co., Inc. Processes for the interconversion of avermectin compounds. 4,423,209, Cl. 536-7.100.
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Dinger, Hans; and Klotz, Helmut, 4,422,296, Cl. 60-606.000.
Mueller, Dieter; Lobig, Inge; and Kerk, Klaus, to Rohm GmbH. Barrel-vault roofing element. 4,422,268, Cl. 52-86.000.
Mueller, Karl F.; and Heiber, Sonia J., to Ciba-Geigy Corporation. Membrane modified hydrogels. 4,423,099, Cl. 428-35.000.
Mueller, Richard A., to Cities Service Company. Apparatus and process for selectively expanding a tube. 4,422,317, Cl. 72-58.000.
Mueller, Robert A., to Tektronix, Inc. Thin-film electrothermal device. 4,423,401, Cl. 337-107.000.
Muller, Alfred; Eschrich, Gerhard; and Schreiber, Achim, to Robert Bosch GmbH. Gear shift control in motor vehicles with automatic transmissions. 4,422,350, Cl. 74-753.000.
Muller, Klaus; and Rieger, Franz, to Robert Bosch GmbH. Combustion process sensor construction. 4,422,321, Cl. 73-35.000.
Muller, Klaus: *See—*
Linder, Ernst; Maurer, Helmut; and Muller, Klaus, 4,422,323, Cl. 73-116.000.
Munroe, Ronald G. Automatic leading edge slat for aircraft. 4,422,606, Cl. 244-203.000.
Munski, Michael S., to Hughes Helicopters, Inc. Apparatus and method for optical phasing of helicopter main rotor blades. 4,422,757, Cl. 356-138.000.
Muramatsu, Tokuji: *See—*
Matsuo, Noritaka; Takeuchi, Koichiro; and Muramatsu, Tokuji, 4,422,415, Cl. 123-52.00M.

Murata, Eiichiro: *See*—
Danno, Tsuneo; Kaano, Masashi; and Murata, Eiichiro, 4,423,517, Cl. 375-1.000.

Murata Manufacturing Co., Ltd.: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Ito, Yoji, 4,423,397, Cl. 333-219.000.

Murayama, Masato; and Manaka, Tetsuyuki, to Clarion Co., Ltd. Microphone holding device. 4,423,293, Cl. 179-156.00R.

Murayama, Tomio; Koguchi, Kenji; Takeuchi, Shigehumi; and Tsukioka, Kazumi, to Fuji Xerox Co., Ltd. Quantization circuit for image data transmission system. 4,423,520, Cl. 375-95.000.

Murphy, Michael P.; Stack, Gary F.; Hoppenrath, James W.; and Taylor, John R., to General Motors Corporation. Quick heat self regulating electric glow heater. 4,423,309, Cl. 219-270.000.

Murrell, Lawrence L.: *See*—
Gould, Kenneth A.; Grenoble, Dane C.; Murrell, Lawrence L.; and Pieters, Wm J. M., 4,422,926, Cl. 208-86.000.

Murrin, Frederick L.: *See*—
Cray, Nicholas K.; Murrin, Frederick L.; and Maupin, Phillip E., 4,422,613, Cl. 248-473.000.

Murtaugh, J. Barry; Laurin, Dean G.; Kling, John E.; and Woodworth, Archie G., to Baxter Travenol Laboratories, Inc. Determining quantitative degree of ethylene oxide exposure in sterilization processes. 4,423,005, Cl. 422-61.000.

Murui, Yukio; and Saitoh, Masaaki, to Shiseido Company, Ltd. Eye makeup preparation. 4,423,031, Cl. 424-63.000.

Musha, Tohru; Kato, Kiichi; and Ito, Kenichi, to Olympus Optical Co., Ltd. Method and apparatus for recording optically an information signal on a record medium along tracks. 4,423,495, Cl. 369-45.000.

Musil, Joseph E., to Iowa Manufacturing Company of Cedar Rapids, Iowa. Heat shields for drum aggregate driers and asphaltic drum mixers. 4,422,848, Cl. 432-118.000.

Muto, Naoki: *See*—
Otani, Masaru; Yaginuma, Satoshi; Tsujino, Masatoshi; Muto, Naoki; Saito, Tetsu; and Fujii, Tadashiro, 4,423,218, Cl. 544-277.000.

Mycro-Group Company: *See*—
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Gordin, Myron K.; Drost, James L.; and Mydosh, Bryan L., 4,423,471, Cl. 362-96.000.

Myers, Noreen. Insect protective garment. 4,422,184, Cl. 2-4.000.

Myers, William H., to Ethyl Corporation Olefin conversion. 4,423,275, Cl. 585-645.000.

Naemura, Hiroshi: *See*—
Kuroda, Hiroshi; Fukuoka, Yoshikazu; Naemura, Hiroshi; and Shihomura, Takayoshi, 4,422,623, Cl. 266-109.000.

Nagata, Hideo: *See*—
Sakurai, Yoshimi; Shinoda, Yutaka; and Nagata, Hideo, 4,422,699, Cl. 339-3.00S.

Naiman, Michael I.: *See*—
Grace, Mark T.; Naiman, Michael I.; and French, Eddie C., 4,422,953, Cl. 252-392.000.

Naito, Han-Ichiro; Yamaguchi, Tsuneo; and Harashima, Kiyoshi, to Elecompack Company Ltd. Shiftable article storage device. 4,422,816, Cl. 414-331.000.

Naito, Hideshi; Nozawa, Hideyo; and Kazami, Kazuyuki, to Nippon Kogaku K. K. Lens barrel suitable for flash photography. 4,423,470, Cl. 362-17.000.

Naito, Tsutomu: *See*—
Onodera, Takashi; Komine, Kikuji; Ohashi, Fumis; and Naito, Tsutomu, 4,422,924, Cl. 208-33.000.

Naito, Youichiro: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,423,061, Cl. 424-274.000.

Nakagawa, Mitsuru: *See*—
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Nakagawa, Nobuaki; Kotani, Kikuo; Katsuragi, Shigeo; Morita, Kaoru; Ohyama, Kunio; and Noda, Toshiharu, to Toyo Jozo Kabushiki Kaisha. Process for the preparation of antibodies. 4,423,034, Cl. 424-85.000.

Nakagome, Yukio; Amano, Kitsutaro; Nakai, Taiichiro; Niiro, Yasuhiko; Ejiri, Yoshihiro; Yamamoto, Hitoshi; and Yamazaki, Yoshihiko, to Kokusai Denshin Denwa Kabushiki Kaisha. Submarine optical fiber cable. 4,422,718, Cl. 350-96.230.

Nakahara, Tosio: *See*—
Kasahara, Nobuo; Nakahara, Tosio; and Yano, Hidetoshi, 4,422,405, Cl. 118-658.000.

Nakai, Taiichiro: *See*—
Nakagome, Yukio; Amano, Kitsutaro; Nakai, Taiichiro; Niiro, Yasuhiko; Ejiri, Yoshihiro; Yamamoto, Hitoshi; and Yamazaki, Yoshihiko, 4,422,718, Cl. 350-96.230.

Nakajima, Shigeharu; Ichinomiya, Keiji; Okada, Koichi; Tsuchikura, Kaname; and Kashiwagi, Minoru, to Nichia Denshi Kagaku Co., Ltd. Green fluorescence-emitting material and a fluorescent lamp provided therewith. 4,423,349, Cl. 313-487.000.

Nakajima, Tsuyoshi: *See*—
Watanabe, Nobuatsu; Nakajima, Tsuyoshi; and Kawaguchi, Masayuki, 4,423,261, Cl. 570-150.000.

Nakamura, Munekazu: *See*—
Shiroto, Yoshimi; Ono, Takeo; Asaoka, Sachio; and Nakamura, Munekazu, 4,422,960, Cl. 502-206.000.

Nakamura, Norihiko, to Rhythm Watch Co., Ltd. Time correcting device for time signalling timepiece. 4,422,777, Cl. 368-185.000.

Nakamura, Yoshitaka, to NEC Kansai, Ltd. Projection type cathode ray tube with masking means. 4,423,438, Cl. 358-231.000.

Nakanishi, Eiji: *See*—
Yasuda, Naohiko; Iwagami, Hisao; Irie, Yasuo; Nakanishi, Eiji; and Saito, Hideomi, 4,423,215, Cl. 544-025.000.

Nakano, Eiji, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Non-contact type potentiometer. 4,423,406, Cl. 338-32.00R.

Nakano, Junji: *See*—
Horie, Seiji; Nakano, Junji; and Sato, Hideo, 4,423,130, Cl. 430-59.000.

Nakashima, Yutaka: *See*—
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Nakata, Tohru; Endo, Hiroyuki; Harada, Masatoshi; Hayasaka, Tadao; and Miyamoto, Osamu, to Hitachi Powdered Metals Co., Ltd. Ferro-sintered alloys. 4,422,875, Cl. 75-243.000.

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Nakazawa, Yuki, to Hitachi Koki Company, Limited. Safety device for preventing overspeed. 4,423,346, Cl. 310-68.00E.

Nalco Chemical Company: *See*—
Jackson, David E., 4,423,096, Cl. 427-397.700.
Selvarajan, Radhakrishnan; Ballweber, Edward G.; and Slovinsky, Manuel, 4,422,944, Cl. 210-736.000.

Nalewick, James A.: *See*—
Cousino, James L.; Nalewick, James A.; and Hills, Blair H., 4,422,940, Cl. 210-631.000.

Narkon, Norman W.: *See*—
Norris, James R.; and Narkon, Norman W., 4,422,675, Cl. 285-45.000.

Nash Engineering Company, The: *See*—
Haavik, Harold K., 4,422,832, Cl. 417-68.000.

National Distillers and Chemical Corporation: *See*—
Hinnenkamp, James A.; and Walatka, Vernon V., Jr., 4,423,020, Cl. 423-277.000.

National Foundation for Cancer Research, Inc.: *See*—
Laki, Koloman, 4,423,076, Cl. 424-322.000.
Welebir, Andrew J., 4,423,236, Cl. 549-320.000.

National Research Development Corporation: *See*—
Arnold, Arthur J.; and Rye, Barry J., 4,422,577, Cl. 239-703.000.
Swinbanks, Malcolm A., 4,423,289, Cl. 381-71.000.

National School Studios, Inc.: *See*—
Hopson, Talmadge W., 4,422,745, Cl. 354-105.000.

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Fuchs, Rainer; Naumann, Klaus; Behrenz, Wolfgang; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,423,066, Cl. 424-305.000.

Navin, Robert F.; and Prom, James R., to Freeman Chemical Corporation. Method for making coated molded articles. 4,422,996, Cl. 264-255.000.

Naylor, Jimmy R.; Lillis, William J.; and Wang, Anthony D., to Burr-Brown Research Corporation. Digital-to-analog converter having single-ended input interface circuit. 4,423,409, Cl. 340-347.0DA.

NCR Corporation: *See*—
Brower, Ronald W.; Chiao, Samuel Y.; Pfeifer, Robert F.; and Romano-Moran, Roberto, 4,422,885, Cl. 148-1.500.
Lawter, Raymond L.; Wills, David C.; and Singh, Narinder, 4,422,782, Cl. 400-56.000.
McPherson, Bruce M., 4,423,320, Cl. 235-482.000.

Neal, Charles H.: *See*—
Herod, James V.; and Neal, Charles H., 4,422,635, Cl. 272-96.000.

Neal, Donald F.; and Blenkinsop, Paul A., to IMI Kynoch Limited. Heat treatment. 4,422,887, Cl. 148-133.000.

Nebu, Hideaki, to Honda Giken Kogyo Kabushiki Kaisha. Rear fender structure for motorcycles. 4,422,659, Cl. 280-152.100.

NEC Kansai, Ltd.: *See*—
Nakamura, Yoshitaka, 4,423,438, Cl. 358-231.000.

NECCHI Societa per Azioni: *See*—
Bar, Alfredo, 4,423,405, Cl. 338-25.000.

Neeb, Rudolf: *See*—
Mohr, Reinhard; and Neeb, Rudolf, 4,423,226, Cl. 548-402.000.

Neefe, Charles W. Centrifugal casting of contact lenses. 4,422,984, Cl. 264-2.1C0.

Neeff, Rutger: *See*—
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Negi, Virendra S.: *See*—
Tague, Steven A.; and Negi, Virendra S., 4,423,483, Cl. 364-200.000.

Neidleman, Saul L.: *See*—
Amon, William F., Jr.; Geigert, John; and Neidleman, Saul L., 4,423,149, Cl. 435-105.000.

Nelson, John E.; Hammond, Charles W.; Huston, Rolland E.; and Helton, Michael R., to Babcock & Wilcox Company, The. Pulsed liquid jet-type cleaning of highly heated surfaces. 4,422,882, Cl. 134-22.180.

Nelsou Research & Development Company: *See*—
Rajadhyaksha, Vithal J.; Peck, James V.; and Minaskanian, Gevork, 4,422,970, Cl. 260-239.30R.
Rajadhyrksha, Vithal J., 4,423,040, Cl. 424-180.000.

Nemoto, Nobuo, to Aderans Co., Ltd. Method for producing workbench for a wig. 4,422,230, Cl. 29-434.000.

Neotronics Limited: *See—*
Buckenham, Howard A.; Feldman, Hugh V.; Gotley, Paul; and Young, Richard, 4,423,487, Cl. 364-551.000.

Neuhouser, Don E., to Power Distribution Products, Inc. Electrical connector plug with receptacle assembly. 4,422,706, Cl. 339-107.000.

Neuman, Bruce H.: *See—*
Chickering, Ronald W.; Yoldas, Bulent E.; and Neuman, Bruce H., 4,422,965, Cl. 252-629.000.

Neumann, Erhard, to Deutsche Automobilgesellschaft mbH. d.c. Blocking oscillator charging device for electric vehicles. 4,423,476, Cl. 363-20.000.

Neuray, Dieter: *See—*
Arlt, Klaus-Peter; Binsack, Rudolf; Grigo, Ulrich; and Neuray, Dieter, 4,423,196, Cl. 526-72.000.

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Neven, Manfred: *See—*
Weir, Donald R.; Masters, Ian M.; and Neven, Manfred, 4,423,007, Cl. 423-2.000.

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N'Guyen, Quang L.: *See—*
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Nichia Denshi Kagaku Co., Ltd.: *See—*
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Nicholson, Ronald L.: *See—*
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Nicolas, Francois: *See—*
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Duchateau, Jacques; and Nicolas, Maurice, 4,422,893, Cl. 156-232.000.

Niemi, Jouko. Feeding device for a jet mill. 4,422,579, Cl. 241-39.000.

Nifco Inc.: *See—*
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Nakagome, Yukio; Amano, Kitsutaro; Nakai, Taiichiro; Niiro, Yasuhiko; Ejiri, Yoshihiro; Yamamoto, Hitoshi; and Yamazaki, Yoshihiko, 4,422,718, Cl. 350-96.230.

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Nilsson, Nils-Joel E.: *See—*
Riede, Gerhard; and Nilsson, Nils-Joel E., 4,422,936, Cl. 210-321.400.

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Hirosaki, Botaro, 4,423,518, Cl. 375-20.000.
Morimoto, Yoshitaka; Shiga, Tomiji; and Ushirogawa, Akio, 4,422,716, Cl. 350-96.210.

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Chibana, Masanobu, 4,422,362, Cl. 84-1.190.
Fushiki, Tatsuo, 4,423,389, Cl. 330-297.000.

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Naito, Hideshi; Nozawa, Hideyo; and Kazami, Kazuyuki, 4,423,470, Cl. 362-17.000.

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Abe, Nobutoshi; Kakizaki, Yukio; and Kobayashi, Jiro, 4,422,547, Cl. 206-328.000.
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Meguro, Hiroshi; and Okabe, Nobuo, 4,422,746, Cl. 354-195.120.
Watanabe, Sakuji; Ogasawara, Akira; Terui, Nobuhiko; Hoshino, Kunihisa; and Utagawa, Ken, 4,422,739, Cl. 354-404.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Kuroda, Hiroshi; Fukuoka, Yoshikazu; Naemura, Hiroshi; and Shihomura, Takayoshi, 4,422,623, Cl. 266-109.000.

Nippon Oil Co., Ltd.: *See—*
Otsuki, Yutaka; Araki, Yoshihiko; Omika, Hiroyoshi; Hara, Hajime; and Aoyama, Kazuho, 4,423,172, Cl. 523-454.000.

Nippon Petrochemicals Company, Limited: *See—*
Miyazaki, Kazuo; Hara, Hajime; Teramoto, Kojiro; Horii, Hideo; Oshimi, Humiaki; and Araki, Yoshihiko, 4,423,239, Cl. 549-541.000.

Nippon Sangyo Kikai Kabushiki Kaisha: *See—*
Hatanaka, Misao, 4,422,930, Cl. 210-150.000.

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Aoki, Akio; and Uchida, Kenichi, 4,422,698, Cl. 308-187.100.

Nippon Soken, Inc.: *See—*
Chiba, Masakazu; Kuwakado, Satosi; Takei, Toshihiro; Tsuge, Noboru; and Shimogawa, Toshiaki, 4,422,669, Cl. 280-806.000.
Kondo, Yasuo; Kato, Masanori; and Nakagawa, Mitsuru, 4,423,307, Cl. 219-202.000.
Tanaka, Hiroaki; and Akita, Shigeyuki, 4,423,417, Cl. 340-870.370.

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Nishimura, Tomio; Yoshino, Hiraku; Takao, Kosei; and Masumoto, Yuuji, 4,422,874, Cl. 75-238.000.

Nippon Zeon Co., Ltd.: *See—*
Sekiya, Masayoshi; Yabe, Masao; Suzuki, Tamotsu; Ochisi, Takeji; and Tatsuta, Sumitaka, 4,423,089, Cl. 427-171.000.
Yamamoto, Haruhisa; and Yoneyama, Nobuaki, 4,423,281, Cl. 585-626.000.

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Sami, Hiroshi; Ito, Osamu; Kawai, Shizuo; Hobo, Nobuhito; Nishio, Teruo; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,423,485, Cl. 364-431.050.

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Inoue, Hidehiko; Nishikawa, Masao; and Anno, Nobuo, 4,422,662, Cl. 280-276.000.

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Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Ito, Yoji, to Murata Manufacturing Co., Ltd. Dielectric resonator and filter with dielectric resonator. 4,423,397, Cl. 333-219.000.

Nishimura, Keizo: *See—*
Kimura, Hiroyuki; Ohashi, Shin-ichi; and Nishimura, Keizo, 4,423,498, Cl. 369-47.000.

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Nishimura, Yozi: *See—*
Komoda, Norio; Kobayashi, Nobuyuki; Itoh, Hiroshi; Nishimura, Yozi; and Obara, Shigenobu, 4,422,497, Cl. 165-23.000.

Nishino, Chikae: *See—*
Sugimori, Fumio; Nishino, Chikae; and Harao, Norio, 4,423,351, Cl. 313-523.000.

Nishio, Teruo: *See—*
Sami, Hiroshi; Ito, Osamu; Kawai, Shizuo; Hobo, Nobuhito; Nishio, Teruo; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,423,485, Cl. 364-431.050.

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Dozono, Kichihiko; and Hasegawa, Yoji, 4,422,431, Cl. 123-568.000.
Ezoe, Mitsuhiko, 4,422,421, Cl. 123-424.000.
Hoshino, Yasunari, 4,422,292, Cl. 60-525.000.
Mochida, Haruo, 4,422,521, Cl. 180-271.000.
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Sakurai, Yukio; Okajima, Masao; and Inoue, Arifumi, 4,422,572, Cl. 237-12.30B.
Suga, Masaaki; Morimoto, Yoshiro; Hamada, Hideo; Futagi, Masaaki; and Suzuki, Tadashi, 4,422,353, Cl. 74-858.000.
Yamaura, Tadao, 4,422,516, Cl. 180-70.00R.

Nitzberg, Jerold I. Adjustable fulcrum hammer. 4,422,620, Cl. 254-26.00E.

Niwa, Masatake: *See—*
Izumi, Tatsuro; Taniguchi, Nobuyuki; Matsumoto, Toshiaki; Niwa, Masatake; Ishida, Tokuji; and Itoh, Masatoshi, 4,422,743, Cl. 354-415.000.

Noda, Toshiharu: *See—*
Nakagawa, Nobuaki; Kotani, Kikuo; Katsuragi, Shigeo; Morita, Kaoru; Ohyama, Kunio; and Noda, Toshiharu, 4,423,034, Cl. 424-85.000.

Nojiri, Howard H.: *See—*
Arzoumanian, Aram S.; Hieber, Heinz W.; Nojiri, Howard H.; and Hart, Jimmie L., 4,422,784, Cl. 400-144.200.

Nomura, Kazuhiko; and Ichikawa, Satoru, to Yamaha Hatsudoki Kabushiki Kaisha. Motorcycle engine exhaust system. 4,422,519, Cl. 180-219.000.

Nordeen, Erwin E., to Whirlpool Corporation. Vacuum cleaner electrical connector. 4,422,702, Cl. 339-15.000.

Nordson Corporation: *See—*
Cobbs, Walter H., Jr.; and Rehman, William R., 4,423,161, Cl. 521-73.000.

Norris, James R.; and Narkon, Norman W., to United Technologies Corporation. Co-axial tube coupling. 4,422,675, Cl. 285-45.000.

Northern Telecom Limited: *See—*
Beun, Roger, 4,423,466, Cl. 361-400.000.
Webb, Gerald F., 4,423,288, Cl. 339-176.00M.

Norton, John: *See—*
Payne, Dennis J.; Mansbridge, Martin H.; Norton, John; and Swadling, Sidney J., 4,422,569, Cl. 228-173.00C.

Norton, John H. R., to AECI Limited. Device for converting alcohols to ethers. 4,422,412, Cl. 123-3.000.

Notoya, Yoshiaki, to Nifco Inc. Fastening structure. 4,422,222, Cl. 24-614.000.

Novak, Richard C.: *See*—
Eaton, Harry E.; and Novak, Richard C., 4,422,648, Cl. 277-53.000.
Nowinch, Heinz K., to Black Clawson Company, The. Slitter-rewinder system. 4,422,588, Cl. 242-56.300.
Nozawa, Hideyo: *See*—
Naito, Hideshi; Nozawa, Hideyo; and Kazami, Kazuyuki, 4,423,470, Cl. 362-17.000.
Nozawa, Reikichi. Liqaefied natural gas-freon electricity generation system. 4,422,298, Cl. 60-655.000.
NPI New Products Investment AB: *See*—
Josefsson, Bertil, 4,422,464, Cl. 132-9.000.
Numata, Masanori: *See*—
Kato, Hiroshi; and Numata, Masanori, 4,423,314, Cl. 235-377.000.
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Nyegaard & Co. A/S: *See*—
Benneche, Tore; Gacek, Mikkel J.; and Undheim, Kjell, 4,423,047, Cl. 424-251.000.
Obara, Shigenobu: *See*—
Komoda, Norio; Kobayashi, Nobuyuki; Itoh, Hiroshi; Nishimura, Yozi; and Obara, Shigenobu, 4,422,497, Cl. 165-23.000.
Obata, Kenji: *See*—
Yamamoto, Ryuichi; Takagi, Akinobu; Kataita, Masafumi; Obata, Kenji; and Mori, Shigeki, 4,422,976, Cl. 260-453.0PH.
Obenaus, Fritz; Greving, Bernd; Balke, Heinrich; and Scholz, Bernhard, to Chemische Werke Huls AG. Process for producing high purity isobutene by dehydrating tertiary butanol. 4,423,271, Cl. 585-639.000.
Obermayer, Alfred, to Bombaridier-Rotax Gesellschaft m.b.H. Pullback starter for internal combustion engines. 4,422,417, Cl. 123-185.0BA.
Obernosterer, Gerhard: *See*—
Gebert, Hans; Loffelhardt, Manfred; and Obernosterer, Gerhard, 4,422,790, Cl. 403-11.000.
Obetz, Judith E.: *See*—
Harper, Lee R.; Obetz, Judith E.; and Steinmetz, William H., 4,423,165, Cl. 523-409.000.
O'Brien, Barry M.: *See*—
McGlothlin, Quentin T.; and O'Brien, Barry M., 4,422,928, Cl. 209-166.000.
Occidental Chemical Company: *See*—
Roy, John W., Jr.; Arbie, Melvin J.; and Holmes, Joel P., 4,423,015, Cl. 423-167.000.
Occidental Chemical Corporation: *See*—
Spore, Everett M., 4,422,909, Cl. 204-95.000.
Stachurski, John Z. O.; and Pokrzyk, Gerald F., 4,422,920, Cl. 204-290.00R.
Witschard, Gilbert, 4,423,188, Cl. 525-71.000.
Ochi, Shikayuki: *See*—
Imaizumi, Ichiro; Ochi, Shikayuki; Kimura, Masatoshi; Yoshimura, Masayoshi; Yamaguchi, Takashi; and Koda, Toyomasa, 4,423,433, Cl. 357-51.000.
Ochiai, Takeji: *See*—
Sekiya, Masayoshi; Yabe, Masao; Suzuki, Tamotsu; Ochiai, Takeji; and Tatsuta, Sumitaka, 4,423,089, Cl. 427-171.000.
O'Connell, Thomas P. Device for checking and resetting smoke alarms. 4,422,682, Cl. 294-19.00R.
O'Connor, Paul B.: *See*—
MacChesney, John B.; O'Connor, Paul B.; and Sullivan, Miles V., 4,422,898, Cl. 156-655.000.
Oda, Kiyoshi, to Yoshida Kogyo K. K. Automatic lock slider for slide fasteners. 4,422,220, Cl. 24-421.000.
Oda, Takaaki: *See*—
Otsuka, Hidehiro; Oda, Takaaki; Sato, Fumiyoshi; and Kikuta, Masaaki, 4,422,724, Cl. 350-307.000.
O'Doherty, George O. P.: *See*—
Clinton, Albert J., deceased; and O'Doherty, George O. P., 4,423,065, Cl. 424-304.000.
Ogasawara, Akira: *See*—
Watanabe, Sakuji; Ogasawara, Akira; Terui, Nobuhiko; Hoshino, Kunihisa; and Utagawa, Ken, 4,422,739, Cl. 354-404.000.
Ogata, Yoshiro; Yamazaki, Haruo; and Akutsu, Hidezoh, to Matushita Electronics Corporation. Fluorescent lamp and process for fabricating the same. 4,423,350, Cl. 313-493.000.
Ogata, Yoshiro; Yamazaki, Haruo; Ikeda, Takashi; and Akutsu, Hidezoh, to Matsushita Electronics Corporation. High-pressure sodium lamp. 4,423,353, Cl. 313-631.000.
Ogawa, Kyosuke: *See*—
Kanbe, Junichiro; Shirai, Shigeru; Ogawa, Kyosuke; Saitoh, Keishi; and Osato, Yoichi, 4,423,133, Cl. 430-95.000.
Ogihara, Masato, to Ricoh Company, Ltd. Apparatus for detecting the remaining amount of rolled paper. 4,422,402, Cl. 111-67.00A.
Oglesbee, Richard W.: *See*—
Crescenzi, Emil J., Jr.; Wilser, Walter T.; Oglesbee, Richard W.; and Gold, Richard B., 4,423,388, Cl. 330-277.000.
Ohashi, Fumis: *See*—
Onodera, Takashi; Komine, Kikuji; Ohashi, Fumis; and Naito, Tsutomu, 4,422,924, Cl. 208-33.000.
Ohashi, Shin-ichi: *See*—
Kimura, Hiroyuki; Ohashi, Shin-ichi; and Nishimura, Keizo, 4,423,498, Cl. 369-47.000.
Ohnesorge, David H.; and Antonazzi, Frank J., to Bendix Corporation, The. Pressure transducer. 4,422,335, Cl. 73-724.000.
Ohsawa, Katsuyuki: *See*—
Sugiyama, Katsuhiko; Ohsawa, Katsuyuki; Fujikake, Kenji; and Idota, Yoshinori, 4,422,423, Cl. 123-438.000.
Ohshita, Youichi: *See*—
Tsukushi, Masanori; Ohshita, Youichi; Hirasawa, Kunio; and Takahashi, Takeshi, 4,423,298, Cl. 200-144.0AP.
Ohtomi, Sadayuki; Hirano, Yasutaka; Tangiku, Iturou; and Kondou, Tamaiti, to Mitsubishi Denki Kabushiki Kaisha. Traction machine for an elevator. 4,422,531, Cl. 187-20.000.
Ohtsuka, Kiyomitsu: *See*—
Nishida, Hiroshi; Takahashi, Tuyoshi; Shiono, Toshio; and Ohtsuka, Kiyomitsu, 4,423,447, Cl. 360-106.000.
Ohyama, Kunio: *See*—
Nakagawa, Nobuaki; Kotani, Kikuo; Katsuragi, Shigeo; Morita, Kaoru; Ohyama, Kunio; and Noda, Toshiharu, 4,423,034, Cl. 424-85.000.
Okabe, Nobuo: *See*—
Meguro, Hiroshi; and Okabe, Nobuo, 4,422,746, Cl. 354-195.120.
Okada, Hitoshi, to Clarion Co., Ltd. Friction transmitting apparatus. 4,422,589, Cl. 242-68.100.
Okada, Hitoshi; Takai, Kazuki; and Yamaguchi, Katsumi, to Clarion Co., Ltd. Clutch system in a tape player. 4,423,445, Cl. 360-96.500.
Okada, Koichi: *See*—
Nakajima, Shigeharu; Ichinomiya, Keiji; Okada, Koichi; Tsuchikura, Kaname; and Kashiwagi, Minoru, 4,423,349, Cl. 313-487.000.
Okajima, Masao: *See*—
Sakurai, Yukio; Okajima, Masao; and Inoue, Arifumi, 4,422,572, Cl. 237-12.30B.
Okamatsu, Sadao, to Shin-Kobe Electric Machinery Co., Ltd. Electric storage battery and a method of making the same. 4,423,123, Cl. 429-160.000.
Okamura, Masatoshi, to TDK Electronics Co., Ltd. Structure of pivotal-shaft receiving hole of thin-walled molding product. 4,422,550, Cl. 206-387.000.
Okamura, Masatoshi; and Shiba, Haruo, to TDK Electronics Co., Ltd. Magnetic tape cassette. 4,422,599, Cl. 242-198.000.
Okawa, Takashi: *See*—
Togai, Nobuo; Hosokawa, Motoyuki; Okawa, Takashi; Wakui, Natsuko; and Watanabe, Toshiyasu, 4,423,257, Cl. 568-902.000.
Oki Electric Industry Co., Ltd.: *See*—
Takayama, Shoichiro, 4,423,424, Cl. 346-76.0PH.
Oki, Kenichi: *See*—
Sato, Sei; Wakitani, Masayuki; Oki, Kenichi; Miura, Shoshin; Yamaguchi, Hisashi; Miyashita, Yoshinori; Shinoda, Tsutae; Yoshikawa, Kazuo; Kurahashi Keizo; and Kawada, Toyoshi, 4,423,356, Cl. 315-169.200.
Okunev, Vyacheslav I.: *See*—
Shestopalov, Alexandr A.; Denikin, Ernst I.; Kharkhuta, Nikolai Y.; Vasiliev, Alexandr A.; and Okunev, Vyacheslav I., 4,422,778, Cl. 374-135.000.
Olah, George A., to PCUK Produits Chimiques Ugine Kuhlmann. Superacid catalyzed preparation of resorcinol from meta-isopropylphenol. 4,423,254, Cl. 568-781.000.
Oldenhof, Christophorus: *See*—
Akkerboom, Piet J.; and Oldenhof, Christophorus, 4,422,971, Cl. 260-245.20R.
Olin Corporation: *See*—
Bordelon, Kent J.; Eschenbacher, Robert C.; and Bridendall, William H., 4,422,900, Cl. 159-48.100.
Gray, Thomas J., 4,422,961, Cl. 502-301.000.
Katz, Lawrence E., 4,423,246, Cl. 564-102.000.
Wojtowicz, John A.; and Hooks, Haywood, 4,423,216, Cl. 544-192.000.
Oliphant, Peter A.: *See*—
Del Principe, Robert M.; and Oliphant, Peter A., 4,422,639, Cl. 273-94.000.
Olive, Gisela: *See*—
Olive, Salvador; and Olive, Gisela, 4,423,113, Cl. 428-389.000.
Olive, Salvador; and Olive, Gisela, to Monsanto Company. Zirconium oxide coated nylon fibers. 4,423,113, Cl. 428-389.000.
Ollivier, Jean-Paul: *See*—
Van Lang, Huynh; and Ollivier, Jean-Paul, 4,423,192, Cl. 525-199.000.
Olsen, Alan J., to Danek Medical, Inc. Restraining device. 4,422,455, Cl. 128-134.000.
Olympus Optical Company Ltd.: *See*—
Enomoto, Fujio, 4,422,742, Cl. 354-413.000.
Fukuoka, Norio, 4,423,455, Cl. 360-137.000.
Hattori, Shinichiro, 4,422,457, Cl. 128-303.100.
Kimura, Kenji, 4,423,436, Cl. 358-98.000.
Musha, Tohru; Kato, Kiichi; and Ito, Kenichi, 4,423,495, Cl. 369-45.000.
Shimizu, Tsutomu; Inaba, Koji; and Araki, Naomiki, 4,422,735, Cl. 351-206.000.
Omega SA: *See*—
Mokdad, Mohamed, 4,423,342, Cl. 310-41.000.
Omika, Hiroyoshi: *See*—
Otsuki, Yutaka; Araki, Yoshihiko; Omika, Hiroyoshi; Hara, Hajime; and Aoyama, Kazuho, 4,423,172, Cl. 523-454.000.
Omori, Hiroyuki; Takeda, Makoto; Fujita, Koichi; and Kataoka, Mitsugi, to Mitsubishi Petrochemical Company Limited. Process for production of 2-methyleneglutaronitrile. 4,422,981, Cl. 260-465.80D.
Omori, Hisashi: *See*—
Yamada, Hirosuke; and Omori, Hisashi, 4,422,873, Cl. 75-52.000.

Omron Tateisi Electronics Co.: *See*—
Sano, Zyunzi; and Maeda, Hideki, 4,423,316, Cl. 235-379.000.
Tanigaki, Shinya, 4,423,313, Cl. 235-379.000.

Omura, Haruo: *See*—
Iwasaki, Hiroshi; Irii, Shinsuke; and Omura, Haruo, 4,423,091, Cl. 427-213.340.

Onder, Kemal: *See*—
Barsa, Edward A.; and Onder, Kemal, 4,423,204, Cl. 528-323.000.

Onishi, Ken: *See*—
Ozaki, Minoru; Onishi, Ken; and Tanaka, Kunimaro, 4,423,441, Cl. 360-13.000.

Ono, Taizo: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,423,061, Cl. 424-274.000.

Ono, Takeo: *See*—
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Onodera, Takashi; Komine, Kikuji; Ohashi, Fumis; and Naito, Tsutomu, to Toa Nenryo Kogyo Kabushiki Kaisha. Solvent dewaxing waxy hydrocarbons using an alpha olefin polymer-olefin vinyl acetate copolymer composite dewaxing aid. 4,422,924, Cl. 208-33.000.

Ooms, Julius, to Procter & Gamble Company, The. Textile treatment compositions and preparation thereof. 4,422,949, Cl. 252-8.800.

Opheij, Willem G.; and Van Rosmalen, Gerard E., to U.S. Philips Corporation. Apparatus for reading and/or writing an optically readable information structure. 4,423,496, Cl. 369-46.000.

Optical Coating Laboratory, Inc.: *See*—
Hahn, Robert E.; Jones, Thomas R.; and Berning, Peter H., 4,422,721, Cl. 350-164.000.

Optimetrix Corporation: *See*—
Phillips, Edward H., 4,422,755, Cl. 355-43.000.

Orcutt, Donald E., to Space-Lyte International, Inc. Optical distribution system including light guide. 4,422,719, Cl. 350-96.300.

Orlov, Anatoly A.: *See*—
Gribanov, Dmitry D.; Kulesh, Vladimir P.; Martynov, Apollinary K.; Orlov, Anatoly A.; Sidorov, Alexandr I.; Fonov, Sergei D.; and Stepanov, Arkady V., 4,422,737, Cl. 352-39.000.

Orlowski, Ronald C.; Groginsky, Charles M.; and Seyler, Jay K., to Armour Pharmaceutical Company. Purification of calcitonin by partition chromatography. 4,422,967, Cl. 260-112.50T.

Orzalesi, Giovanni, to Societa Italo-Britannica L. Manetti-H. Roberts & Co. Derivatives of 2-amino-5-(o-sulphamidophenyl)-1,3,4-thiadiazol as antiviral agents and a process for the preparation thereof. 4,423,053, Cl. 424-269.000.

Osato, Yoichi: *See*—
Kanbe, Junichiro; Shirai, Shigeru; Ogawa, Kyosuke; Saitoh, Keishi; and Osato, Yoichi, 4,423,133, Cl. 430-95.000.

Osborn, Melvin N., to Lockheed Corporation. Variable shape, fluid flow nozzle for sound suppression. 4,422,524, Cl. 181-215.000.

O'Shea, Ronald J.; Balkey, Joseph P.; Hooper, Andre; and Kelly, Richard A., III, to Union Carbide Corporation. Integrated mobile tank-servicing system. 4,422,485, Cl. 141-98.000.

Oshima, Harumi, to Tokico Ltd. Disc brake. 4,422,534, Cl. 188-73.380.

Oshima, Yoshimasa: *See*—
Koizumi, Mitsuyoshi; Akiyama, Nobuyuki; and Oshima, Yoshimasa, 4,423,331, Cl. 250-572.000.

Oshimi, Humiaki: *See*—
Miyazaki, Kazuo; Hara, Hajime; Teramoto, Kojiro; Horii, Hideo; Oshimi, Humiaki; and Araki, Yoshihiko, 4,423,239, Cl. 549-541.000.

Osipow, Lloyd I.: *See*—
Spitzer, J. George; and Osipow, Lloyd I., 4,422,877, Cl. 106-122.000.

Osrodek Badawczo-Rozwojowy Samochodow Malolitrazowych Bosmal: *See*—
Wiatrak, Wieslaw, 4,422,430, Cl. 123-568.000.

Ostertag, Edward L.: *See*—
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Otani, Masaru; Yaginuma, Satoshi; Tsujino, Masatoshi; Muto, Naoki; Saito, Tetsu; and Fujii, Tadashiro, to Toyo Jozo Kabushiki Kaisha. Antibiotic neplanocin A. 4,423,218, Cl. 544-277.000.

Otsuka, Hidehiro; Oda, Takaaki; Sato, Fumiyoshi; and Kikuta, Masaaki, to Nissan Motor Co., Ltd. Rear view mirror arrangement to be mounted on a vehicle door. 4,422,724, Cl. 350-307.000.

Otsuki, Yutaka; Araki, Yoshihiko; Omika, Hiroyoshi; Hara, Hajime; and Aoyama, Kazuho, to Nippon Oil Co., Ltd. Self-curable coating composition for cathode-precipitating electrodeposition. 4,423,172, Cl. 523-454.000.

Otto, Jeffrey B.: *See*—
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Nakamura, Norihiko, 4,422,777, Cl. 368-185.000.
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Riebel, Hans-Jochem; Eue, Ludwig; and Faust, Wilfried, to Bayer Aktiengesellschaft. Antidotes for protecting plants from herbicide damage. 4,422,866, Cl. 71-92.000.
Riede, Gerhard; and Nilsson, Nils-Joel E., to Gambro AG. Device for the diffusion of substances between two fluids via semipermeable membranes. 4,422,936, Cl. 210-321.400.
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Cheesman, Barbara E.; and Alikhan, Raza, 4,422,548, Cl. 206-370.000.
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McClure, Don W., 4,422,692, Cl. 301-37.0SS.
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Rodda, Donald, to Singer Company, The. Thread handling arrangement with fiber carrying strip and cam. 4,422,395, Cl. 112-254.000.
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Roeger, Carl R.; Miller, William D.; and Goodin, Charles R., to Hobart Corporation. Food processing machine. 4,422,582, Cl. 241-82.500.
Roesner, Bruce B., to Burroughs Corporation. JFET Dynamic memory. 4,423,490, Cl. 365-149.000.
Roger, Renoulin; and Le Brun, Jean Y. Communications system for interconnecting a plurality of asynchronous data processing terminals. 4,423,507, Cl. 370-89.000.
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Greenman, Norman L.; Berry, Richard C.; Tracy, Douglas H.; Arnio, Bruce M.; Lunt, Michael S.; and Otto, Jeffrey B., 4,423,109, Cl. 428-288.000.
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Rohm GmbH: *See*—
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Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,422,868, Cl. 71-98.000.
Chang, Ching-Jen; and Stevens, Travis E., 4,423,199, Cl. 526-307.600.
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Rohrbaugh, Galen V. Wire rope cleaning tool. 4,422,208, Cl. 15-256.600.
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Rol, Gabriel. Apparatus and process for making a fur yarn. 4,422,285, Cl. 57-31.000.
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Roly-Door Sales Company of Rochester, Inc.: *See*—
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Rooney, Clarence S.; Williams, Haydn W. R.; Gragoe, Edward J., Jr.; and Patchett, Arthur A., to Merck & Co., Inc. 2,4-Dioxo-4-substituted-1-butaoic acid derivatives useful in treating urinary track calcium oxalate lithiasis. 4,423,063, Cl. 424-278.000.
Roos, Hans; Boehn, Hugo; Bittler, Knut; and Schlaefer, Dieter, to BASF Aktiengesellschaft. Bipolar electrodes with graphite as the carrier and their production. 4,422,921, Cl. 204-290.00R.
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Devos, Francis; Bussiere, Guy; and Huchette, Michel, 4,423,086, Cl. 427-3.000.
Rosa, Stephen P., to TVI Energy Corporation. Infrared target for military applications and its use. 4,422,646, Cl. 273-348.100.
Rosel, Hans-Dieter, to J.S. Staedtler K.G. Writing medium unit for writing or drawing machines. 4,423,429, Cl. 346-140.00R.
Rosenblatt, Michael; and Potts, John T., Jr., to General Hospital Corporation, The. Inhibitors of peptide hormone action. 4,423,037, Cl. 424-177.000.
Rosenthal, Joel W.; and Dahlberg, Arthur J., to Chevron Research Company. Coal liquefaction and hydroprocessing of petroleum oils. 4,422,922, Cl. 208-8.0LE.
Ross, Gary. Combination nail holder, nail shield, and nail finishing set. 4,422,489, Cl. 145-46.000.
Ross, Sidney D., to Sprague Electric Company. Treatment of tantalum powder. 4,423,004, Cl. 419-35.000.
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Rossman, Wendell E. Horizontal axis wind energy conversion system with aerodynamic blade pitch control. 4,423,333, Cl. 290-44.000.
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Rothenberg, Douglas H.; and Nicholson, Ronald L., to Standard Oil Company, The. Process for cooling a continuously moving material to a predetermined temperature. 4,422,303, Cl. 62-63.000.
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Roy, Pierre L.: *See*—
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Rubenstein, Kenneth E.; and Ullman, Edwin F., to Syva Company. β-D-Galactosidase conjugate for enzyme immunoassays. 4,423,143, Cl. 435-7.000.
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Ruscitto, Robert A., to Boston Edison Company. Tamper-proof fastener. 4,422,679, Cl. 292-307.00R.
Russell, Robert J. Automatic draft controller. 4,422,440, Cl. 126-292.000.
Russo, Joseph L.; and Sonder, Richard, to Simmons Universal Corporation. Fitted bed sheet and method of manufacture. 4,422,195, Cl. 5-497.000.
Rusteberg, Robert K., to Panlmatic Company. Actinic ozone periodontal irrigating apparatus and method. 4,422,450, Cl. 128-62.00A.
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Sadler, John H. R.; Pask, George; and Wilkinson, Wilfred H., to Rolls-Royce Limited. Method of making an airfoil member for a gas turbine engine. 4,422,229, Cl. 29-156.80H.
Saguchi, Hiroto; Hayama, Masashi; and Sakai, Keitaro, to TDK Electronics Co., Ltd. Magnetic powder for magnetic recording medium. 4,423,114, Cl. 428-403.000.
Saito, Eiiji; Aizawa, Shoji; Mitsui, Michio; Miyata, Tomohiko; and Kuroda, Masayuki, to Ransburg Japan, Ltd. Electrostatic coating machine and method of changing color of paints thereby. 4,422,576, Cl. 239-693.000.
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Saito, Takashi; and Kumei, Hiroshi, to Victor Company of Japan, Ltd. Height position adjusting device for a reproducing transducer in a rotary recording medium reproducing apparatus. 4,423,504, Cl. 369-292.000.
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Sakurai, Yoshimi; Shinoda, Yutaka; and Nagata, Hideo, to Honda Giken Kogyo Kabushiki Kaisha & Furukawa Electric Co., Ltd. Electrical connector device in a vehicular steering system. 4,422,699, Cl. 339-3.00S.
Sakurai, Yukio; Okajima, Masao; and Inoue, Arifumi, to Nissan Motor Co., Ltd. Engine cooling water circulation system. 4,422,572, Cl. 237-12.30B.
Salmon, Michel, to Laiteries Hubert Triballat. Acidulation of milk. 4,423,081, Cl. 426-271.000.
Salort, Guy J. External apparatus for vertical stance and walking for those with handicapped motor systems of the lower limbs. 4,422,453, Cl. 128-80.00G.
Sambell, Kenneth W. Method of and apparatus for increasing propulsive efficiency of aircraft propellers. 4,422,828, Cl. 416-135.000.
Sami, Hiroshi; Ito, Osamu; Kawai, Shizuo; Hobo, Nobuhito; Nishio, Teruo; and Toyota Jidosha Kogyo Kabushiki Kaisha, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Electric control apparatus for fuel injection pumps. 4,423,485, Cl. 364-431.050.
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Sanford, James L.: *See*—
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Santos, Gerard R., to Budd Company, The. Support means for a plurality of solar panels. 4,422,614, Cl. 248-475.00R.

Sasaki, Kinji: *See—*
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Sasaki, Nobuo, to Fujitsu Limited. Semiconductor integrated circuit device providing a protection circuit. 4,423,431, Cl. 357-41.000.

Sasaki, Noriaki, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Method of ascertaining the state inside melting furnace for radioactive waste. 4,422,326, Cl. 173-291.000.

Satake, Kunio: *See—*
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Sato, Akira, to Lonseal Kogyo Co., Ltd. Process for forming open cell sheet, sheet formed by process, intermediate for forming said sheet and process for forming said intermediate. 4,423,110, Cl. 428-304.400.

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Sato, Sei; Wakitani, Masayuki; Oki, Kenichi; Miura, Shoshin; Yamaguchi, Hisashi; Miyashita, Yoshinori; Shinoda, Tsutae; Yoshikawa, Kazuo; Kurahashi Keizo; and Kawada, Toyoshi, to Fujitsu Limited. Self-shift type gas discharge panel. 4,423,356, Cl. 315-169.200.

Sato, Yasushi: *See—*
Fukawa, Isaburo; Satake, Kunio; Yamada, Tsuyoshi; Hayakawa, Kiyoshi; and Sato, Yasushi, 4,423,190, Cl. 525-98.000.

Sato, Yukio: *See—*
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Sawyer, Edgar W., Jr., to International Telephone and Telegraph Corporation. Method of thickening solutions using normally nongelling clays. 4,422,855, Cl. 44-51.000.

Saxe, Robert L.: *See—*
Thompson, Robert I.; and Saxe, Robert L., 4,422,963, Cl. 252-583.000.

Scanland, Joseph E., to Roper Corporation. Lawnmower with longitudinal support frame. 4,422,283, Cl. 56-320.200.

Schack, Carl J.: *See—*
Christe, Karl O.; and Schack, Carl J., 4,423,260, Cl. 570-147.000.

Schad, Robert D., to Husky Injection Molding Systems Ltd. Method and apparatus for molding hollow, slender workpieces. 4,422,995, Cl. 264-250.000.

Schaefer, Joy M.: *See—*
Das, Narayan; and Schaefer, Joy M., 4,422,886, Cl. 148-31.500.

Schafer, Klaus, to Schicker & Schafer. Arrangement for cleaning containers of diverse shapes. 4,422,466, Cl. 134-55.000.

Schering Aktiengesellschaft: *See—*
Skuballa, Werner; Raduchel, Bernd; Schwarz, Norbert; Vorbruggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., 4,423,067, Cl. 424-305.000.

Schering Corporation: *See—*
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Strayer, James G., 4,423,035, Cl. 424-92.000.

Schicker & Schafer: *See—*
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Schickfluss, Rudolf: *See—*
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Schierhorst, Albert E.: *See—*
Reese, Dennis L.; Regehr, John L.; Schierhorst, Albert E.; Soderstrom, Ronald L.; and Thompson, James M., 4,423,425, Cl. 346-76.0PH.

Schiff, Peter. Percutaneous balloon. 4,422,447, Cl. 128-1.00D.

Schiffmann, Robert F.: *See—*
Bedrosian, Karakian; and Schiffmann, Robert F., 4,423,080, Cl. 426-124.000.

Schiller, Saul. Tripod open throat T-square and drafting board. 4,422,245, Cl. 33-403.000.

Schilling, Walter: *See—*
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,423,231, Cl. 548-451.000.

Schillinger, Ekkehard: *See—*
Skuballa, Werner; Raduchel, Bernd; Schwarz, Norbert; Vorbruggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., 4,423,067, Cl. 424-305.000.

Schirmer, Ulrich; Rohr, Wolfgang; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Aralkylphenylureas and herbicides containing these. 4,422,871, Cl. 71-120.000.

Schlaefer, Dieter: *See—*
Roos, Hans; Boehn, Hugo; Bittler, Knut; and Schlaefer, Dieter, 4,422,921, Cl. 204-290.00R.

Schlatter, Beat: *See—*
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Schlumberger Technology Corporation: *See—*
Ellis, Darwin V.; and Flaum, Charles, 4,423,323, Cl. 250-264.000.

Schmid, Rolyn A., to Bender Machine Works, Inc. Pump. 4,422,831, Cl. 417-63.000.

Schmidt, Bernhard, to Felten & Guilleaume Carlswerk Aktiengesellschaft. Coupling arrangement for optical waveguides. 4,422,717, Cl. 350-96.210.

Schmidt, Helmut; Ramm, Ulrich; and Schroeder, Alexander, to Messerschmitt-Boelkow-Blohm GmbH. Endless spring, such as ring-spring. 4,422,627, Cl. 267-148.000.

Schmidt, Herbert; and Steinort, Hans, to Senkingwerk GmbH. Tunnel-type batch washing machine. 4,422,309, Cl. 68-16.000.

Schmukler, Seymour: *See—*
Machonis, John, Jr.; Schmukler, Seymour; Zeitlin, Robert J.; and Shida, Mitsuzo, 4,423,117, Cl. 428-475.800.

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Dunham, H. E.; Arana, David; Jackson, Terrell D.; McEuen, Brent E.; and Schneider, John A., 4,422,624, Cl. 266-182.000.

Schneider, Jurgen: *See—*
Falkenbach, Gunther; Seuwen, Dieter; Schneider, Jurgen; and Kahlcke, Hartwig, 4,422,343, Cl. 74-16.000.

Schneider, Manfred: *See—*
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Schneider, Morris D., to Research Corporation. Acid soluble platelet aggregating material isolated from human umbilical cord. 4,423,036, Cl. 424-105.000.

Schnitker, Wolfgang: *See—*
Scholz, Heinz; Schnitker, Wolfgang; and Klein, Ernst, 4,422,910, Cl. 204-96.000.

Schnur, Rodney C., to Pfizer Inc. Hypoglycemic 5-substituted oxazolidine-2,4-diones. 4,423,233, Cl. 549-58.000.

Schoening, Josef: *See—*
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Schoepe, Erich G. Disposable stackable splatter shield and frame therefore. 4,422,441, Cl. 126-299.00C.

Scholl, Winfried: *See—*
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Scholz, Bernhard: *See—*
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Scholz, Heinz; Schnitker, Wolfgang; and Klein, Ernst, to U.S. Philips Corporation. Method of manufacturing acicular goethite. 4,422,910, Cl. 204-96.000.

Scholz, Ray J.; and Southern, William C., to Sierra Precast, Inc. Prefabricated fireplace and the installation thereof. 4,422,438, Cl. 126-120.000.

Schopper, Bernd; and Berisch, Volker, to ITT Industries, Inc. Braking pressure control unit for a hydraulic brake system. 4,422,694, Cl. 303-84.00A.

Schreiber, Achim: *See—*
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Schroder, Ulrich, to Deutsche Babcock Aktiengesellschaft. Solid-fuel burner. 4,422,389, Cl. 110-264.000.

Schroeder, Alexander: *See—*
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Schroeder, Donald R.: *See—*
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Schroff, Ludwig, deceased: *See—*
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Schroff, Meinie Thea, heiress: *See—*
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Schuierer, Manfred: *See—*
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Schultz, Arthur N.; Diring, James A.; and Krueger, Donald G., to Alwin Manufacturing Company, Inc. Toilet paper dispenser with sliding mandrels. 4,422,585, Cl. 242-55.530.

Schultz, William E.; and Vogl, Jeffrey S., to Vogl-Schultz, Incorporated. Tree steps. 4,422,527, Cl. 182-92.000.

Schurter, Rolf: *See—*
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Schuster, Claus: *See—*
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Schwarzmann, Matthias: *See—*
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Schwiers, Hans-Georg: *See—*
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Schwieter, Ulrich: *See—*
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Scott, Leon R., to Stratford Squire International. Rotary grain mill having means for controlling air and grain flow therethrough, and method. 4,422,578, Cl. 241-6.000.

Scott Paper Company: *See—*
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SDS Biotech Corporation: *See—*
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Sealectro Corporation: *See—*
Berezowski, Jaroslaw; and Feinman, Harvey M., 4,423,317, Cl. 235-458.000.

Secher, David S.; and Burke, Derek C. Monoclonal antibody to interferon-α. 4,423,147, Cl. 435-68.000.

Security Shutter Corp.: *See—*
Forquer, William F., 4,422,493, Cl. 160-133.000.

Seeger, Walter, to Roth-Technik GmbH. Muffler. 4,422,525, Cl. 181-255.000.

Seelbach, Walter C.; and Hansen, Boyd K., to Motorola, Inc. Majority logic gate. 4,423,339, Cl. 307-464.000.

Seelye, David E.: *See—*
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Seeney, Charles E.; Kraemer, John F.; and Ingebrigtsen, Janis, to International Minerals & Chemical Corp. Process for preparing olivine sand cores and molds. 4,422,496, Cl. 164-528.000.

Seiichi Ishizaka, President of Agency of Industrial Science and Technology: *See—*
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Seit, Horst, to Krauss-Maffei Aktiengesellschaft. Track structure for a tracked vehicle. 4,422,696, Cl. 305-28.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
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Sekiya, Masayoshi; Yabe, Masao; Suzuki, Tamotsu; Ochiai, Takeji; and Tatsuta, Sumitaka, to Fuji Photo Film Co., Ltd.; and Nippon Zeon Co., Ltd. Subbing process for photographic light-sensitive materials. 4,423,089, Cl. 427-171.000.

Selvarajan, Radhakrishnan; Ballweber, Edward G.; and Slovinsky, Manuel, to Nalco Chemical Company. Cationic polymers suitable for reducing turbidity in low turbidity waters. 4,422,944, Cl. 210-736.000.

Sempel, Adrianus, to U.S. Philips Corporation. Current mirror arrangement. 4,423,387, Cl. 330-85.000.

Senatore, Guy, to Phillips Petroleum Company. Thickenable composition based on an adduct of alkadiene polymers and acid anhydride. 4,423,177, Cl. 524-251.000.

Senet, Jean-Pierre G.: *See—*
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Seng, Stephen: *See—*
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Senkingwerk GmbH: *See—*
Schmidt, Herbert; and Steinort, Hans, 4,422,309, Cl. 68-16.000.

Senturia, Stephen D.; and Garverick, Steven L., to Massachusetts Institute of Technology. Methods and apparatus for microdielectrometry. 4,423,371, Cl. 324-61.00R.

Ser, Jean-Claude: *See—*
Koulbanis, Constantin; Ser, Jean-Claude; and N'Guyen, Quang L., 4,422,952, Cl. 252-309.000.

Serboli, Giancarlo: *See—*
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Serradimigni, Charles M., to General Electric Company. Combined capacitor and resistor. 4,423,463, Cl. 361-275.000.

Seuwen, Dieter: *See—*
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Seyler, Jay K.: *See—*
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Shaheen, Joseph M., to Rockwell International Corporation. Connection array for interconnecting hermetic chip carriers to printed circuit boards using plated-up pillars. 4,423,467, Cl. 361-403.000.

Shannon, Roger L.: *See—*
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Shapiro, Alan K.; and Siebach, Henry R., to Western Electric Co., Inc. Releasably retaining articles for rotation thereof. 4,422,652, Cl. 279-1.00M.

Sharp Kabushiki Kaisha: *See—*
Kozaki, Shuichi; Funada, Fumiaki; Minezaki, Shigehiro; and Uede, Hisashi, 4,422,730, Cl. 350-339.00R.
Yoshida, Hideo; and Tsuda, Hiroshi, 4,423,290, Cl. 381-51.000.

Sharp, Russell G.; Wilkinson, William R.; Reed, Charles C.; and Cooley, Denton A., to Texas Medical Products, Inc. Blood and perfusate filter. 4,422,939, Cl. 210-445.000.

Shatterproof Glass Corporation: *See—*
McKelvey, Harold E., 4,422,916, Cl. 204-192.00R.

Shatuck, Lawrence A., to Deere & Company. Transmission control system with improved modulation rate regulating valve. 4,422,536, Cl. 192-3.570.

Shaw, Paul V.; Payne, Larry W.; Sanborn, Charles E.; and Lutz, Eugene F., to Shell Oil Company. Recovery of secondary alkanols. 4,423,256, Cl. 568-886.000.

Sheffer Collet Company: *See—*
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Waite, Carlson A., 4,422,655, Cl. 279-118.000.

Sheiman, David M.; and Rudell, Elliot A. Stereoscopic viewing and projection system. 4,422,720, Cl. 350-138.000.

Sheiman, Julius; and Sheiman, Samuel. Non-readily detachable luggage support unit. 4,422,212, Cl. 16-29.000.

Sheiman, Samuel: *See—*
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Johnson, Thomas H., 4,423,276, Cl. 585-665.000.
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Shelly, Randolph D. W., to Sperry Corporation. Fast switching field effect transistor driver circuit. 4,423,341, Cl. 307-570.000.

Shenouda, Soliman Y. K., to General Foods Corp. Fabricated protein fiber bundles. 4,423,083, Cl. 426-574.000.

Shepherd, Nigel R. C.; and Preece, Graham M., to Haigh Engineering Co. Ltd., The. Macerator pumping impeller. 4,422,580, Cl. 241-46.110.

Shepherd, Robert G., to American Cyanamid Company. 4-[(Cycloalkyl or cycloalkenyl substituted) amino, alkylamino or alkenylamino]benzoic acids, salts and derivatives thereof. 4,423,051, Cl. 424-263.000.

Sherosky, Frank J.: *See—*
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Sherritt Gordon Mines Limited: *See—*
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Shestopalov, Alexandr A.; Denikin, Ernst I.; Kharkhuta, Nikolai Y.; Vasiliev, Alexandr A.; and Okunev, Vyacheslav I. Method for measuring asphalt pavement temperature and device for implementation of the same. 4,422,778, Cl. 374-135.000.

Shiba, Haruo: *See—*
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Shibayama, Yuho: *See—*
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Shiga, Tomiji: *See—*
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Shihomura, Takayoshi: *See—*
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Shimada, Junichi: *See—*
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Shimano Industrial Company Limited: *See—*
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Shimano, Keizo, to Shimano Industrial Company Limited. An elliptical shaped streamlined fishing rod. 4,422,259, Cl. 43-18.100.

Shimizu, Akihiko, to Inoue-Japax Research Incorporated. Digital drive apparatus for effecting control displacements in an electroerosive machine tool. 4,423,302, Cl. 219-69.00G.

Shimizu, Ippei: *See—*
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Shimizu, Tsutomu; Inaba, Koji; and Araki, Naomiki, to Olympus Optical Company, Ltd. Fundus camera. 4,422,735, Cl. 351-206.000.

Shimogawa, Toshiaki: *See—*
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Shimura, Haruo; and Kawata, Takao, to Fujikura Rubber Ltd. Method of producing a compressible layer and a blanket for printing operation. 4,422,895, Cl. 156-633.000.

Shin-Kobe Electric Machinery Co., Ltd.: *See—*
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Shinano, Tomoyuki: *See—*
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Shinoda, Tsutae: *See—*
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Shinoda, Yutaka: *See—*
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Shinya, Sadahiko: *See—*
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Takahashi, Tuyoshi; Nishida, Hiroshi; and Shiono, Toshio, 4,423,446, Cl. 360-106.000.

Shiozaki, Keniti; and Hibi, Hazuo, to Hitachi, Ltd. Logic tracing apparatus. 4,423,508, Cl. 371-16.000.

Shirahama, Kengoro, to Clarion Co., Ltd. Surface acoustic wave filter. 4,423,395, Cl. 333-193.000.

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Shiroto, Yoshimi; Ono, Takeo; Asaoka, Sachio; and Nakamura, Munekazu, to Chiyoda Chemical Engineering & Construction Co., Ltd. Catalysts for hydrotreatment of heavy hydrocarbon oils containing asphaltenes. 4,422,960, Cl. 502-206.000.
Shiseido Company, Ltd.: *See*—
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Shore, Sydney. Ribbon cartridge construction. 4,422,785, Cl. 400-208.000.
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Sieber, Peter: *See*—
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Siegel, Hardo: *See*—
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Kleinschmidt, Peter; Meixner, Hans; and Magori, Valentin, 4,423,347, Cl. 310-331.000.
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Simco Company, Inc., The: *See*—
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Simmons U.S.A. Corporation: *See*—
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Simmons Universal Corporation: *See*—
Russo, Joseph L.; and Sonder, Richard, 4,422,195, Cl. 5-497.000.
Simon, Lionel N.; and Maxwell, Kameron W. Pharmaceutical compositions of deglycyrrhizinated licorice (DGL). 4,423,027, Cl. 424-16.000.
Simons, Charles R. Gameboard and carrying case. 4,422,645, Cl. 273-286.000.
Simpson, Neville H.; Riggs, Peter P.; and Rasmussen, Warren W., to AMSTED Industries Incorporated. Fiber reinforced plastic impregnated wire rope. 4,422,286, Cl. 57-221.000.
Simpson Strong-Tie Company, Inc.: *See*—
Gilb, Tyrell T., 4,422,792, Cl. 403-232.100.
Simson, Michael B., to University Patents, Inc. Electrocardiographic means and method for detecting potential ventricular tachycardia. 4,422,459, Cl. 128-702.000.
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Korosi, Jeno; Lang, Tibor; Andrasi, Ferenc; Szekely, Jozsef; Hamori, Tamas; Balogh, Tibor; Ila, Lajos; Goldschmidt, Katalin; Sineger, Eleonora; and Moravcsik, Imre, 4,423,044, Cl. 424-244.000.
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Rodda, Donald, 4,422,395, Cl. 112-254.000.
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Sitabkhan, Mansur, to Eaton Corporation. Multi-passage rotor coupling. 4,422,676, Cl. 285-136.000.
SKF Kugellagerfabriken GmbH: *See*—
Illg, Peter, 4,422,227, Cl. 29-116.00R.
Skinner, James H., to Federal Screw Works. Method of forming a torque nut. 4,422,196, Cl. 10-86.00A.
Skousen, Russell K.: *See*—
Zerlaut, Gene A.; Dokos, William T.; Putman, William J.; and Skousen, Russell K., 4,423,469, Cl. 362-2.000.
Skovrinski, Adam L.: *See*—
Birkmaier, Albert A.; Harpell, Gary A.; Kurtz, Bruce E.; Patel, Gordhanbhai N.; Poncha, Rustom P.; Skovrinski, Adam L.; and Lesco, James M., 4,422,907, Cl. 204-38.00B.
Skuballa, Werner; Raduchel, Bernd; Schwarz, Norbert; Vorbruggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., to Schering Aktiengesellschaft. Carbacyclins, their preparation and use. 4,423,067, Cl. 424-305.000.
Skukalek, Edward M., to PPG Industries, Inc. Method of and device for reducing apparatus response time during the testing for moisture content in moving spaced plastic sheets. 4,422,766, Cl. 356-445.000.
Skulnick, Harvey I., to Upjohn Company, The. Nucleosides and process. 4,423,212, Cl. 536-23.000.
Slavin, Michael; and Sherosky, Frank J., to Lectron Products, Inc. Inertial lock for vehicle door latch. 4,422,522, Cl. 180-281.000.
Slocum, Donald H.; and Eaton, James W., to Masonite Corporation. Building panel. 4,422,266, Cl. 52-58.000.
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Selvarajan, Radhakrishnan; Ballweber, Edward G.; and Slovinsky, Manuel, 4,422,944, Cl. 210-736.000.
Sloviter, Henry A., to University of Pennsylvania, The. Perfluorochemical emulsion artificial blood. 4,423,077, Cl. 424-325.000.
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Smith, Donald L.; Kosowski, Zenon V.; and Marks, Robert R., Jr., to Conoco Inc. Temporary vanes to straighten gas flow in scrubbers. 4,422,342, Cl. 73-863.430.
Smith, Enoch P., to Allen-Bradley Company. Self diagnostic switch circuit. 4,423,322, Cl. 250-229.000.
Smith, Helene S.: *See*—
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Smith, James E., to Micro Motion, Inc. Method and apparatus for mass flow measurement. 4,422,338, Cl. 73-861.380.
Smith, John L.: *See*—
Cassaday, Michael M.; and Smith, John L., 4,422,773, Cl. 366-341.000.
Smith, Paul; and Lemstra, Pieter J., to Stamicarbon B.V. Process for the preparation of filaments of high tensile strength and modulus. 4,422,993, Cl. 264-210.800.
Smith, Paul A., Jr.: *See*—
Buxe, Paul M.; Marshall, James F.; and Smith, Paul A., Jr., 4,422,827, Cl. 416-193.00A.
Smith, Stanley, to Rolls Royce Limited. Fluid processing device. 4,422,821, Cl. 415-89.000.
Snellgrove, Richard A., to General Refractories Company. Densification of caustic magnesia and sintered periclase by acid doping. 4,423,026, Cl. 423-636.000.
Societa Italo-Britannica L. Manetti-H. Roberts & Co.: *See*—
Orzalesi, Giovanni, 4,423,053, Cl. 424-269.000.
Societe Anonyme de Telecommunications: *See*—
Chavany, Jean C.; and Koreicho, Wladimir, 4,422,601, Cl. 244-3.130.
S.A. Des Etablissements Staubli: *See*—
Palau, Joseph, 4,422,481, Cl. 139-88.000.
Societe Anonyme dite: CERAVER: *See*—
Thuillier, Denis; and Willem, Michel, 4,423,285, Cl. 174-146.000.
Societe Anonyme dite, Societe Industrielle des Nouvelles Techniques Radioelectriques: *See*—
Droguet, Jean-Paul; and Vernay, Michel, 4,422,731, Cl. 350-344.000.
Societe ASTECH: *See*—
Fage, Etienne, 4,422,605, Cl. 244-110.00B.
Societe Nationale des Poudres et Explosifs: *See*—
Burgard, Michel; Piteau, Marc D.; Rollat, Alain J.; and Senet, Jean-Pierre G., 4,423,235, Cl. 549-229.000.
Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation "S.N.E.C.M.A.": *See*—
Mons, Claude M.; Pernot, Michel J.; and Spinat, Roland R., 4,423,097, Cl. 427-423.000.
Societe Nouvelle de Bouchons Plastiques: *See*—
Babiol, Pierre, 4,422,563, Cl. 222-153.000.
Soderstrom, Ronald L.: *See*—
Reese, Dennis L.; Regehr, John L.; Schierhorst, Albert E.; Soderstrom, Ronald L.; and Thompson, James M., 4,423,425, Cl. 346-76.0PH.

Solomon, Donald F., to Brodshy, Roy. Paint can shaker. 4,422,768, Cl. 366-110.000.

Solomon, Harry, to Toastess Inc. Frypan lid. 4,422,560, Cl. 220-377.000.

Sommer Co.: *See*—
Sommer, Gordon M., 4,422,540, Cl. 192-113.00B.

Sommer, Gordon M., to Sommer Co. Clutch/brake unit with modular heat exchanger. 4,422,540, Cl. 192-113.00B.

Sonder, Richard: *See*—
Russo, Joseph L.; and Sonder, Richard, 4,422,195, Cl. 5-497.000.

Sonoi, Shinsuke: *See*—
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Sony Corporation: *See*—
Tachi, Katsuichi, 4,423,440, Cl. 358-335.000.
Wada, Kazuo; Chihara, Toshita; Saito, Tetsuya; and Suzuki, Mitsuo, 4,422,707, Cl. 339-143.00R.

Sorensen, George C. Flash system power generator. 4,422,299, Cl. 60-681.000.

Sorensen, Jens O. Controlled ejection method for injection molding. 4,422,998, Cl. 264-335.000.

Southern, William C.: *See*—
Scholz, Ray J.; and Southern, William C., 4,422,438, Cl. 126-120.000.

Space-Lyte International, Inc.: *See*—
Orcutt, Donald E., 4,422,719, Cl. 350-96.300.

Spangler, Elson B. Method and system for measurement of road profile. 4,422,322, Cl. 73-105.000.

Spell, William D. Portable charcoal igniters or ignition systems and apparatus relating thereto. 4,422,435, Cl. 126-25.00B.

Spencer, Darrell C.: *See*—
Debney, Howard A.; and Spencer, Darrell C., 4,422,934, Cl. 210-222.000.

Sperry Corporation: *See*—
Bennett, Clarence L., Jr.; and Price, Robert, 4,423,519, Cl. 375-80.000.
Campbell, Willis R.; and Eggers, Edward T., 4,422,374, Cl. 100-88.000.
Chi, Chao S., 4,423,451, Cl. 360-125.000.
Decoene, Frans J. G. C., 4,422,462, Cl. 130-27.0AA.
Groves, Kenneth W.; and Lea, John D., 4,423,494, Cl. 367-123.000.
Hanson, Merlin L.; Swenson, Robert E.; and Talarczyk, Anthony R., 4,423,479, Cl. 364-200.000.
Hargrove, Arthur K.; and Brown, Ronald L., 4,423,482, Cl. 364-200.000.
Shelly, Randolph D. W., 4,423,341, Cl. 307-570.000.

Spinat, Roland R.: *See*—
Mons, Claude M.; Pernot, Michel J.; and Spinat, Roland R., 4,423,097, Cl. 427-423.000.

Spinks, Brian M., to Motorola, Inc. Sense amplifier. 4,423,340, Cl. 307-530.000.

Spitzer, J. George; and Osipow, Lloyd I., to Restech Research Limited Partnership. Synthetic polymer-propellant compositions forming cold foamed structures having a temperature at least 30° C. below ambient temperature and containing open and/or closed cells. 4,422,877, Cl. 106-122.000.

Spongr, Jerry J.; Tiebor, John E.; and Joffe, Boris B., to Twin City International Inc. Measuring system for use in the radiation measurement of layer thicknesses and the like. 4,423,328, Cl. 250-358.100.

Spore, Everett M., to Occidental Chemical Corporation. Electrolytic process for the manufacture of alkali metal halate. 4,422,909, Cl. 204-95.000.

Spotzl, Markus. Device for separating meat from bones. 4,422,216, Cl. 17-1.00G.

Sprague Electric Company: *See*—
Ross, Sidney D., 4,423,004, Cl. 419-35.000.

Spring Technology, Ltd.: *See*—
Proctor, Rudy R., 4,422,666, Cl. 280-694.000.

Srikrishnan, Kris V.: *See*—
Howard, James K.; and Srikrishnan, Kris V., 4,423,087, Cl. 427-79.000.

Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telefonie): *See*—
da Silva, Herman, 4,423,413, Cl. 340-825.030.

Stachurski, John Z. O.; and Pokrzyk, Gerald F., to Occidental Chemical Corporation. Hydrogen cathode. 4,422,920, Cl. 204-290.00R.

Stack, Gary F.: *See*—
Murphy, Michael P.; Stack, Gary F.; Hoppenrath, James W.; and Taylor, John R., 4,423,309, Cl. 219-270.000.

Stafford, George C., to Finnigan Corporation. Apparatus for detecting negative ions. 4,423,324, Cl. 250-281.000.

Stahler, Fritz: *See*—
Batz, Hans-Georg; Albert, Winfried; Lenz, Helmut; Linke, Hans-Ralf; and Stahler, Fritz, 4,423,227, Cl. 548-406.000.

Stahly, Tim S., to University of Kentucky Research Foundation, The. Method for improving the metabolic stability and survival of neonatal pigs. 4,423,072, Cl. 424-312.000.

Stamicarbon B.V.: *See*—
Smith, Paul; and Lemstra, Pieter J., 4,422,993, Cl. 264-210.800.

Stampfer, Martha R.; Smith, Helene S.; and Hackett, Adeline J. Enhanced growth medium and method for culturing human mammary epithelial cells. 4,423,145, Cl. 435-32.000.

Standard Oil Company: *See*—
Grasselli, R. K.; Burrington, J. D.; Pesa, F. A.; and Hardman, H. F., 4,422,980, Cl. 260-465.80D.
Rothenberg, Douglas H.; and Nicholson, Ronald L., 4,422,303, Cl. 62-63.000.
Velenyi, Louis J.; Hardman, Harley F.; and Pesa, Fred A., 4,423,023, Cl. 423-376.000.

Standard Oil Company (Indiana): *See*—
Arzoumanidis, Gregory G.; and Lee, Sam S., 4,422,956, Cl. 502-158.000.
Bertolacini, Ralph J.; Hirschberg, Eugene H.; and Modica, Frank S., 4,423,019, Cl. 423-244.000.

Standard Register Company, The: *See*—
Hull, Harvey C.; and Henz, Robert W., Sr., 4,422,358, Cl. 83-356.300.

Statz, Robert G.; and Belson, William W., to Capitol Stampings Corp. Solar energy collection apparatus. 4,422,434, Cl. 126-438.000.

Stauffer Chemical Company: *See*—
Baker, Don R., 4,423,237, Cl. 549-362.000.
Hyzak, Daniel L.; and Pallos, Ferenc M., 4,422,869, Cl. 71-100.000.
Subramanian, N., 4,422,982, Cl. 260-502.50F.
Walker, Frank H.; and Wolfe, Ordell L., 4,423,028, Cl. 424-40.000.

Stearns, Charles F.; and Tutherly, Herbert W., to United Technologies Corporation. Fuel control for gas turbine engines. 4,422,287, Cl. 60-39.281.

Steber, Charles E., to General Electric Company. Aft mounting system for combustion transition duct members. 4,422,288, Cl. 60-39.320.

Steele, Daniel W. Hand-held map viewer and navigational aid. 4,422,738, Cl. 353-11.000.

Steinmetz, William H.: *See*—
Harper, Lee R.; Obetz, Judith E.; and Steinmetz, William H., 4,423,165, Cl. 523-409.000.

Steinort, Hans: *See*—
Schmidt, Herbert; and Steinort, Hans, 4,422,309, Cl. 68-16.000.

Stendel, Wilhelm: *See*—
Fuchs, Rainer; Naumann, Klaus; Behrenz, Wolfgang; Hammann, Ingeborg; Hömeyer, Bernhard; and Stendel, Wilhelm, 4,423,066, Cl. 424-305.000.

Stenudd, Lars-Gunnar M.: *See*—
Stenudd, Sven G. V.; and Stenudd, Lars-Gunnar M., 4,423,361, Cl. 318-135.000.

Stenudd, Sven G. V.; and Stenudd, Lars-Gunnar M., to Facit Aktiebolag. Mechanical drive apparatus for providing linear motion in response to electrical drive signals. 4,423,361, Cl. 318-135.000.

Stepanov, Arkady V.: *See*—
Gribanov, Dmitry D.; Kulesh, Vladimir P.; Martynov, Apollinary K.; Orlov, Anatoly A.; Sidorov, Alexandr I.; Fonov, Sergei D.; and Stepanov, Arkady V., 4,422,737, Cl. 352-39.000.

Stepp, Elvin; and Claypoole, Gary, to Cincinnati Electronics Corporation. Pulse control circuit. 4,423,381, Cl. 328-14.000.

Sterling Drug Inc.: *See*—
Bryant, Robert J., 4,422,955, Cl. 502-169.000.
Carlson, John A., 4,423,046, Cl. 424-248.400.

Steuernagle, Richard L., to Rockwell International Corporation. Tamper proof gas meter. 4,422,674, Cl. 285-30.000.

Stevens, Travis E.: *See*—
Chang, Ching-Jen; and Stevens, Travis E., 4,423,199, Cl. 526-307.600.

Stevens, William J. Method and apparatus for recovering metals from metal rich solutions. 4,422,912, Cl. 204-109.000.

Stewart, Roger G.; and Mazin, Moshe, to RCA Corporation. Apparatus for decoding multiple input lines. 4,423,432, Cl. 357-45.000.

Stich, Frederick A., to Siemens-Allis, Inc. Signal processing system for overload relay or the like. 4,423,458, Cl. 361-93.000.

Stich, Frederick A.; and Williams, Conrad F., to Siemens-Allis, Inc. Solid state circuit protection system and method. 4,423,459, Cl. 361-94.000.

Stobe, Richard: *See*—
Bonfilio, Paul F.; and Stobe, Richard, 4,422,685, Cl. 296-197.000.

Stocker, Raymond, to Ford Motor Company. Throttle valve linkage adjustment gauge and method therefor. 4,422,242, Cl. 33-181.0AT.

Storni, Angelo: *See*—
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,423,231, Cl. 548-451.000.

Stracke, Wilfried: *See*—
Kolodzey, Jurgen; Schoening, Josef; Schwiers, Hans-Georg; and Stracke, Wilfried, 4,422,340, Cl. 73-861.630.

Stratford Squire International: *See*—
Scott, Leon R., 4,422,578, Cl. 241-6.000.

Strayer, James G., to Schering Corporation. Method for preventing injection site abscess. 4,423,035, Cl. 424-92.000.

Strickland, Benjamin W. Solar furnace apparatus. 4,422,446, Cl. 126-438.000.

Strickland, John C.: *See*—
Williams, Dale; and Strickland, John C., 4,422,925, Cl. 208-75.000.

Stroud, William R. Alkylation process utilizing absorption refrigeration. 4,423,277, Cl. 585-719.000.

Strutton, Bernice M.; and Moore, Robert R. Micturition adaptor for conversion of a male bed urinal to female use. 4,422,188, Cl. 4-144.400.

Stubbings, James H., to Potomac Applied Mechanics, Inc. Universal conveyor. 4,422,543, Cl. 198-782.000.

Stucky, Dennis J.: *See*—
Jackson, Alan D.; and Stucky, Dennis J., 4,422,470, Cl. 137-484.200.

Stutius, Wolfgang E., to Xerox Corporation. Method for successfully depositing doped II-VI epitaxial layers by organometallic chemical vapor deposition. 4,422,888, Cl. 148-175.000.

Stutzman, Thomas F.: *See*—
Callaway, Milton A.; and Stutzman, Thomas F., 4,423,308, Cl. 219-217.000.

Subramanian, N., to Stauffer Chemical Company. Method for preparation of N-phosphonomethylglycine. 4,422,982, Cl. 260-502.50F.

Suga, Masaaki; Morimoto, Yoshiro; Hamada, Hideo; Futagi, Masaaki; and Suzuki, Tadashi, to Nissan Motor Co., Ltd. Lock-up control method of and system for automatic transmission for automotive vehicle having engine provided with fuel cut means. 4,422,353, Cl. 74-858.000.

Sugai, Haruo; Hamabe, Takafumi; Yamamura, Yukio; Otuka, Shinpei; and Moriwaki, Hiroshi, to Matsushita Electric Works, Ltd. Massaging apparatus. 4,422,448, Cl. 128-44.000.

Sugimori, Fumio; Nishino, Chikae; and Harao, Norio, to Tokyo Shibaura Denki Kabushiki Kaisha. Vacuum container of radiation image multiplier tube and method of manufacturing the same. 4,423,351, Cl. 313-523.000.

Sugimori, Shigeru; Kojima, Tetsukiko; and Tsuji, Masakazu, to Chisso Corporation. Liquid crystal benzene derivatives. 4,422,951, Cl. 252-299.630.

Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus capable of performing special reproduction. 4,423,497, Cl. 369-47.000.

Sugiyama, Katsuhiko; Ohsawa, Katsuyuki; Fujikake, Kenji; and Idota, Yoshinori, to Kabushiki Kaisha Toyota Chuo Kenyusho. Jet control type carburetor. 4,422,423, Cl. 123-438.000.

Sugizaki, Tsugio, to Konishiroku Photo Industry Co., Ltd. Paper feeding device for recording apparatus. 4,422,631, Cl. 271-9.000.

Suh, Nam P.: *See*—
Haven, Richard E.; and Suh, Nam P., 4,423,191, Cl. 525-169.000.

Sukopp, Wolfgang: *See*—
Thill, Albert; and Sukopp, Wolfgang, 4,422,668, Cl. 280-804.000.

Sullivan, Daniel R.: *See*—
Trainor, Thomas M.; and Sullivan, Daniel R., 4,423,084, Cl. 426-589.000.

Sullivan, Miles V.: *See*—
MacChesney, John B.; O'Connor, Paul B.; and Sullivan, Miles V., 4,422,898, Cl. 156-655.000.

Sulzer Brothers Limited: *See*—
Hintsch, Otto, 4,422,482, Cl. 139-188.00R.
Zweymuller, Karl, 4,422,187, Cl. 3-1.913.

Sumi, Akiyasu: *See*—
Kawai, Tohru; and Sumi, Akiyasu, 4,422,740, Cl. 354-25.000.

Sumitomo Chemical Company, Limited: *See*—
Suzuki, Yukio; Hayashi, Masahiro; and Takuma, Kenzi, 4,422,978, Cl. 260-465.00D.

Sumitomo Rubber Industries, Ltd.: *See*—
Arimatsu, Toshio, 4,422,987, Cl. 264-40.100.

Sun Electric Corporation: *See*—
Jacobs, William R.; Karlin, Richard A.; and Sun, Peter K., 4,423,379, Cl. 324-429.000.

Sun, Peter K.: *See*—
Jacobs, William R.; Karlin, Richard A.; and Sun, Peter K., 4,423,379, Cl. 324-429.000.

Suncor, Inc.: *See*—
Morgan, George W., 4,422,399, Cl. 114-42.000.

Sundstrand Data Control, Inc.: *See*—
Groenewegen, Johannes B.; and Meginniss, Stephen M., III, 4,422,598, Cl. 242-192.000.

Sunohara, Hideki: *See*—
Morishita, Takashi; Sunohara, Hideki; and Sonoi, Shinsuke, 4,422,985, Cl. 264-4.400.

Sutherland, Ray; and Wood, Mark S., to Rockwell International Corporation. Dual purpose water meter cover. 4,422,325, Cl. 73-273.000.

Sutter, Ormond, to Lok Products Company. Cosmetic cover for channelled type grid systems. 4,422,272, Cl. 52-311.000.

Suttkus, David J.: *See*—
Drutchas, Gilbert H.; and Suttkus, David J., 4,422,834, Cl. 417-283.000.

Suyama, Tadakazu: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,423,061, Cl. 424-274.000.

Suzuki, Hideo: *See*—
Hasuo, Shinya; and Suzuki, Hideo, 4,423,430, Cl. 357-5.000.

Suzuki, Hirosuke; and Ishigohoka, Norikazu. Flat cable. 4,423,282, Cl. 174-36.000.

Suzuki, Mitsuo: *See*—
Wada, Kazuo; Chihara, Toshita; Saito, Tetsuya; and Suzuki, Mitsuo, 4,422,707, Cl. 339-143.00R.

Suzuki, Ryoichi; and Uchiyama, Takashi, to Canon Kabushiki Kaisha. Electro-optical diaphragm with radial electrodes. 4,422,729, Cl. 350-336.000.

Suzuki, Tadashi: *See*—
Suga, Masaaki; Morimoto, Yoshiro; Hamada, Hideo; Futagi, Masaaki; and Suzuki, Tadashi, 4,422,353, Cl. 74-858.000.

Suzuki, Tamotsu: *See*—
Sekiya, Masayoshi; Yabe, Masao; Suzuki, Tamotsu; Ochiai, Takeji; and Tatsuta, Sumitaka, 4,423,089, Cl. 427-171.000.

Suzuki, Yukio; Hayashi, Masahiro; and Takuma, Kenzi, to Sumitomo Chemical Company, Limited. Method for preparing optically active carboxylic acid esters. 4,422,978, Cl. 260-465.00D.

Svendsen, Gordon D., to Ampex Corporation. Programmable multiple frequency ratio synchronous clock signal generator circuit and method. 4,423,383, Cl. 328-63.000.

Sverre, Severin F. Magnetic water conditioning device. 4,422,933, Cl. 210-222.000.

Svoboda, Joseph J.: *See*—
Kowalczyk, Dennis C.; Bricklemyer, Bruce A.; and Svoboda, Joseph J., 4,422,927, Cl. 208-211.000.

Swadling, Sidney J.: *See*—
Payne, Dennis J.; Mansbridge, Martin H.; Norton, John; and Swadling, Sidney J., 4,422,569, Cl. 228-173.00C.

Swanson, Larry D., to Deere & Company. Connection between telescopic suspension struts for snowmobile skis and stabilizer member. 4,422,657, Cl. 280-21.00R.

Sweatman, Ronald E., to Hughes Tool Company. Method of grouting offshore structures. 4,422,805, Cl. 405-225.000.

Sweet, Ralph: *See*—
Poggemiller, Erhard; and Sweet, Ralph, 4,422,511, Cl. 172-260.500.

Swenson, Robert E.: *See*—
Hanson, Merlin L.; Swenson, Robert E.; and Talarczyk, Anthony R., 4,423,479, Cl. 364-200.000.

Swinbanks, Malcolm A., to National Research Development Corporation. Signal processing systems. 4,423,289, Cl. 381-71.000.

Swiss Aluminium Ltd.: *See*—
Frank, Simon, 4,422,612, Cl. 248-430.000.
Mittelmann, Gerhard; Brodbeck, Klaus P.; and Bretschneider, Gerd, 4,422,558, Cl. 220-1.500.

Swithenbank, Colin: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,422,868, Cl. 71-98.000.

Swope, Jack G.; and Weiss, Harry C., to Rensco Incorporated. Brake mechanism for spool. 4,422,592, Cl. 242-75.450.

Syntex (U.S.A.) Inc.: *See*—
Li, Tsung-tee; and Marx, Michael, 4,423,068, Cl. 424-305.000.
Verheyden, Julien P. H.; and Martin, John C., 4,423,050, Cl. 424-253.000.
Walker, Keith A. M., 4,423,057, Cl. 424-273.00R.

Syva Company: *See*—
Rubenstein, Kenneth E.; and Ullman, Edwin F., 4,423,143, Cl. 435-7.000.

Szekely, Jozsef: *See*—
Korosi, Jeno; Lang, Tibor; Andrasi, Ferenc; Szekely, Jozsef; Hamori, Tamas; Balogh, Tibor; Ila, Lajos; Goldschmidt, Katalin; Sineger, Eleonora; and Moravcsik, Imre, 4,423,044, Cl. 424-244.000.

Szostak, Jan, to Singer Company, The. Belt retainer guard for sewing machine. 4,422,396, Cl. 112-261.000.

T & N Materials Research Limited: *See*—
Atkinson, Alan W.; and Lancaster, Janet M., 4,422,894, Cl. 156-62.200.

Tachi, Katsuichi, to Sony Corporation. Code signal reading apparatus. 4,423,440, Cl. 358-335.000.

Tague, Steven A.; and Negi, Virendra S., to Honeywell Information Systems Inc. Data processor using a read only memory for selecting a part of a register into which data is written. 4,423,483, Cl. 364-200.000.

Taisho Denki Kogyo Kabushiki Kaisha: *See*—
Wada, Kazuo; Chihara, Toshita; Saito, Tetsuya; and Suzuki, Mitsuo, 4,422,707, Cl. 339-143.00R.

Takada, Juichiro. Belt clamps for vehicle occupant restraint belt systems. 4,422,593, Cl. 242-107.200.

Takada, Koichi: *See*—
Komiya, Yutaka; and Takada, Koichi, 4,422,751, Cl. 355-14.0SH.

Takagi, Akinobu: *See*—
Yamamoto, Ryuichi; Takagi, Akinobu; Kataita, Masafumi; Obata, Kenji; and Mori, Shigeki, 4,422,976, Cl. 260-453.0PH.

Takahara, Takeshi: *See*—
Koike, Norio; Takahara, Takeshi; Shirakawa, Yasuhiro; and Ikari, Kunihiro, 4,423,128, Cl. 430-28.000.

Takahashi, Masaaki: *See*—
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,423,259, Cl. 570-144.000.

Takahashi, Takeshi: *See*—
Tsukushi, Masanori; Ohshita, Youichi; Hirasawa, Kunio; and Takahashi, Takeshi, 4,423,298, Cl. 200-144.0AP.

Takahashi, Tuyoshi; Nishida, Hiroshi; and Shiono, Toshio, to Hitachi, Ltd. Magnetic data recording and reading device with magnetic head positioning mechanism. 4,423,446, Cl. 360-106.000.

Takahashi, Tuyoshi: *See*—
Nishida, Hiroshi; Takahashi, Tuyoshi; Shiono, Toshio; and Ohtsuka, Kiyomitsu, 4,423,447, Cl. 360-106.000.

Takai, Kazuki: *See*—
Okada, Hitoshi; Takai, Kazuki; and Yamaguchi, Katsumi, 4,423,445, Cl. 360-96.500.

Takao, Kosei: *See*—
Nishimura, Tomio; Yoshino, Hiraku; Takao, Kosei; and Masumoto, Yuuji, 4,422,874, Cl. 75-238.000.

Takashi, Okawa: *See*—
Ishogai, Nobuo; Motoyuki, Hosokawa; Takashi, Okawa; Wakui, Natsuko; and Watanabe, Toshiyasu, 4,423,258, Cl. 568-902.000.

Takasu, Yoshio; Sakai, Kiyoshi; Mabuchi, Minoru; Ishikawa, Shozo; and Watanabe, Katsunori, to Canon Kabushiki Kaisha. Electrophotographic member having layer containing methylidenyl hyrazone compound. 4,423,129, Cl. 430-59.000.

Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,423,213, Cl. 544-16.000.

Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, to Fujinawa Pharmaceutical Co., Ltd. 7-Acylamino-3-vinylcephalosporanic acid derivatives and processes for the preparation thereof. 4,423,213, Cl. 544-16.000.

Takayama, Shoichiro, to Oki Electric Industry Co., Ltd. Thermal head for facsimile printer. 4,423,424, Cl. 346-76.0PH.
Takeda Chemical Industries, Ltd.: *See—*
Imai, Kin-ichi; and Mano, Mitsuhiko, 4,423,219, Cl. 544-326.000.
Takeda, Makoto: *See—*
Omori, Hiroyuki; Takeda, Makoto; Fujita, Koichi; and Kataoka, Mitsugi, 4,422,981, Cl. 260-465.80D.
Takei, Toshihiro: *See—*
Chiba, Masakazu; Kuwakado, Satosi; Takei, Toshihiro; Tsuge, Noboru; and Shimogawa, Toshiaki, 4,422,669, Cl. 280-806.000.
Takeuchi, Akihiko: *See—*
Hoshino, Osamu; Ito, Michio; and Takeuchi, Akihiko, 4,422,749, Cl. 355-3.0DD.
Takeuchi, Koichiro: *See—*
Matsuo, Noritaka; Takeuchi, Koichiro; and Muramatsu, Tokuji, 4,422,415, Cl. 123-52.00M.
Takeuchi, Koji: *See—*
Kitamura, Nobuyoshi; Ito, Nobuo; and Takeuchi, Koji, 4,423,175, Cl. 524-100.000.
Takeuchi, Shigehumi: *See—*
Murayama, Tomio; Koguchi, Kenji; Takeuchi, Shigehumi; and Tsukioka, Kazumi, 4,423,520, Cl. 375-95.000.
Takuma, Kenzi: *See—*
Suzuki, Yukio; Hayashi, Masahiro; and Takuma, Kenzi, 4,422,978, Cl. 260-465.00D.
Talarczyk, Anthony R.: *See—*
Hanson, Merlin L.; Swenson, Robert E.; and Talarczyk, Anthony R., 4,423,479, Cl. 364-200.000.
Talos Systems, Inc.: *See—*
Bergeron, Gary A., 4,423,286, Cl. 178-19.000.
Tamarkin, Michael J. Video game control unit and lap board holder therefor. 4,422,640, Cl. 273-148.00R.
Tamerlani, Giancarlo: *See—*
Cannata, Vincenzo; and Tamerlani, Giancarlo, 4,423,244, Cl. 562-466.000.
Tamura, Ryutaro; and Endo, Yasushi, to Alps Electric Co., Ltd. Variable capacitance type push-button switch. 4,423,464, Cl. 361-288.000.
Tamura, Sadahiro: *See—*
Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Ito, Yoji, 4,423,397, Cl. 333-219.000.
Tanaka, Hiroaki; and Akita, Shigeyuki, to Nippon Soken, Inc. Capacitance type distance detecting apparatus. 4,423,417, Cl. 340-870.370.
Tanaka, Kazuo; and Ikemori, Keiji, to Canon Kabushiki Kaisha. Photographic lens system having an auxiliary lens. 4,422,734, Cl. 350-422.000.
Tanaka, Kunimaro: *See—*
Ozaki, Minoru; Onishi, Ken; and Tanaka, Kunimaro, 4,423,441, Cl. 360-13.000.
Tangiku, Iturou: *See—*
Ohtomi, Sadayuki; Hirano, Yasutaka; Tangiku, Iturou; and Kondou, Tamsiti, 4,422,531, Cl. 187-20.000.
Tanigaki, Shinya, to Omron Tateisi Electronics Co. Transaction processing system. 4,423,313, Cl. 235-379.000.
Taniguchi, Nobuyuki: *See—*
Izumi, Tatsuro; Taniguchi, Nobuyuki; Matsumoto, Toshiaki; Niwa, Masatake; Ishida, Tokuji; and Itoh, Masatoshi, 4,422,743, Cl. 354-415.000.
Tarcsay, Lajos: *See—*
Baschang, Gerhard; Hartmann, Albert; Wacker, Oskar; and Tarcsay, Lajos, 4,423,038, Cl. 424-177.000.
Taskis, Charles B., to Beecham Group Limited. Pharmaceutical compositions. 4,423,033, Cl. 424-80.000.
Tatevosian, Ruben A.: *See—*
Nikolaev, Nikolai I.; Tereschenko, Lev A.; Yakovlev, Arian M.; Kovalenko, Vitaly I.; Tatevosian, Ruben A.; Titov, Mikhail Y.; and Lipatov, Nikolai K., 4,422,876, Cl. 106-104.000.
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Tatsuta, Sumitaka: *See—*
Sekiya, Masayoshi; Yabe, Masao; Suzuki, Tamotsu; Ochiai, Takeji; and Tatsuta, Sumitaka, 4,423,089, Cl. 427-171.000.
Tavernier, Boyd D. Hydraulically adjustable pavement roller. 4,422,796, Cl. 404-128.000.
Taylor, John R.: *See—*
Murphy, Michael P.; Stack, Gary F.; Hoppenrath, James W.; and Taylor, John R., 4,423,309, Cl. 219-270.000.
Taylor, Thomas P.: *See—*
Gerwick, Ben C., Jr.; Price, Edward B.; and Taylor, Thomas P., 4,422,804, Cl. 405-210.000.
Taylor, William K.: *See—*
Bauer, Wayne J.; Dodt, William C.; Kirkpatrick, Charles R.; Rehage, Ted A.; Robinson, Francis L.; and Taylor, William K., 4,423,480, Cl. 364-200.000.
TDK Electronics Co., Ltd.: *See—*
Kajimoto, Norifumi; Kawakami, Yoshio; and Sasaki, Kinji, 4,423,452, Cl. 360-131.000.
Kawahara, Hiroshi; Azegami, Hitoshi; and Horigome, Eiji, 4,423,453, Cl. 360-131.000.
Okamura, Masatoshi, 4,422,550, Cl. 206-387.000.
Okamura, Masatoshi; and Shiba, Haruo, 4,422,599, Cl. 242-198.000.
Saguchi, Hiroto; Hayama, Masashi; and Sakai, Keitaro, 4,423,114, Cl. 428-403.000.
Tokuda, Fuminori; and Nakashima, Yutaka, 4,423,115, Cl. 428-425.900.
Technicon Instruments Corporation: *See—*
Cassaday, Michael M.; and Smith, John L., 4,422,773, Cl. 366-141.000.
Teepak, Inc.: *See—*
Liekens, J. Alfons F.; and Hendriks, Ivo G. M., 4,422,215, Cl. 17-1.00R.
Tektronix, Inc.: *See—*
Mueller, Robert A., 4,423,401, Cl. 337-107.000.
Wilke, William G., 4,423,337, Cl. 307-247.00R.
Tell, Ernest L.: *See—*
Iverson, James R.; Tell, Ernest L.; and Pinotti, Terry L., 4,423,336, Cl. 307-64.000.
Temme, Helmut; and Beckmann, Erwin, to Gewerkschaft Eisenhutte Westfalia. Scraper-chain conveyors. 4,422,542, Cl. 198-735.000.
Temple, Davis L., Jr., to Mead Johnson & Company. 2-[4-[(4,4-Dialkyl-2,6-piperidinedion-1-yl)butyl]-1-piperazinyl]pyrimidines. 4,423,049, Cl. 424-251.000.
Teng-Ching, Weng; and Chi-Ming, Yang. Combination electronic circuit element with multidirectionally adjustable joints. 4,423,465, Cl. 361-394.000.
Teramoto, Kojiro: *See—*
Miyazaki, Kazuo; Hara, Hajime; Teramoto, Kojiro; Horii, Hideo; Oshimi, Humiaki; and Araki, Yoshihiko, 4,423,239, Cl. 549-541.000.
Teraoka, Kazuharu, to Teraoka Seikosho Co., Ltd. Printing control apparatus for a label printer. 4,422,376, Cl. 101-69.000.
Teraoka Seikosho Co., Ltd.: *See—*
Teraoka, Kazuharu, 4,422,376, Cl. 101-69.000.
Teraoka, Syoichi. Method for molding hollow plastic articles. 4,423,000, Cl. 264-524.000.
Tereschenko, Lev A.: *See—*
Nikolaev, Nikolai I.; Tereschenko, Lev A.; Yakovlev, Arian M.; Kovalenko, Vitaly I.; Tatevosian, Ruben A.; Titov, Mikhail Y.; and Lipatov, Nikolai K., 4,422,876, Cl. 106-104.000.
Terui, Nobuhiko: *See—*
Watanabe, Sakuji; Ogasawara, Akira; Terui, Nobuhiko; Hoshino, Kunihisa; and Utagawa, Ken, 4,422,739, Cl. 354-404.000.
Test, Howard R., II, to Texas Instruments Incorporated. Assembly of an electronic device on an insulative substrate. 4,423,435, Cl. 357-65.000.
Tetro, Richard S., to Black Clawson Company, The. Method and apparatus for roll changing. 4,422,586, Cl. 242-56.00R.
Teuopharm-Schiedam B.V.: *See—*
van Maanen, Johannes D., 4,422,591, Cl. 242-72.100.
Texaco Inc.: *See—*
Waddill, Harold G., 4,423,170, Cl. 523-417.000.
Williams, Dale; and Strickland, John C., 4,422,925, Cl. 208-75.000.
Texas Instruments Incorporated: *See—*
Piptone, Paul J., 4,422,786, Cl. 400-229.000.
Test, Howard R., II, 4,423,435, Cl. 357-65.000.
Texas Medical Products, Inc.: *See—*
Sharp, Russell G.; Wilkinson, William R.; Reed, Charles C.; and Cooley, Denton A., 4,422,939, Cl. 210-445.000.
Thiel, Klaus F.: *See—*
Henriksen, Arthur J.; Thiel, Klaus F.; and Peterson, Carl F., 4,422,390, Cl. 110-341.000.
Thill, Albert; and Sukopp, Wolfgang, to Volkswagenwerk Aktiengesellschaft. Passive safety device. 4,422,668, Cl. 280-804.000.
Thoenig, Marcel, to ETA SA, Fabriques d'Ebauches. Device for controlling the functions of a watch and for displaying the state of at least one of the controlled functions. 4,422,775, Cl. 368-74.000.
Thomas, Alvin D., to Albany International Corp. Stud holders for reel assembly. 4,422,595, Cl. 242-116.000.
Thomas & Betts Corporation: *See—*
Christensen, Gordon D.; and Donaher, Charles J., 4,422,703, Cl. 339-74.00R.
Williams, Russell H.; Garner, Peter; and Gordon, K. Scott, 4,422,715, Cl. 350-96.200.
Thomas, Richard D.; and Kjeldsen, William R. Key case. 4,422,316, Cl. 70-456.00R.
Thomas, Rudolf: *See—*
Lantzsch, Reinhard; Ditgens, Klaus; Heinemann, Ulrich; Thomas, Rudolf; and Weber, Erhard, 4,423,225, Cl. 548-373.000.
Thomas, Sherrill G.: *See—*
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Thomm, Ernest C.: *See—*
Gusack, James A.; Bird, David O.; Thomm, Ernest C.; and Reitz, William A., 4,422,224, Cl. 28-272.000.
Thompson, Danny R.: *See—*
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Thompson, Donald R.: *See—*
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Thompson, James M.: *See—*
Reese, Dennis L.; Regehr, John L.; Schierhorst, Albert E.; Soderstrom, Ronald L.; and Thompson, James M., 4,423,425, Cl. 346-76.0PH.
Thompson, Robert I.; and Saxe, Robert L., to Research Frontiers Incorporated. Light valve polarizing materials and suspensions thereof. 4,422,963, Cl. 252-583.000.
Thomson-CSF: *See—*
Beck, Jean L.; Le Bars, Jean F.; Emmanuelli, Yves A.; and Bargues, Denis, 4,423,437, Cl. 358-113.000.

Thomson, David S.: *See*—
Jones, Geraint; Preston, John; and Thomson, David S., 4,423,070, Cl. 424-311.000.
Thorn Emi Domestic Electrical Appliances Limited: *See*—
Child, Robert P.; and Charles, Barry G., 4,422,371, Cl. 99-323.100.
Thorneburg, James L. Sock. 4,422,307, Cl. 66-172.00E.
Thorogood, Robert M., to International Coal Refining Company. Convective heater. 4,422,411, Cl. 122-7.00R.
Thuillier, Denis; and Willem, Michel, to Societe Anonyme dite: CERAVER. Electric insulator, in particular for a phase spacer, a compensating arm or a distance piece. 4,423,285, Cl. 174-146.000.
Thurm, Siegfried; and Bunge, Konrad, to Agfa-Gevaert Aktiengesellschaft. Method of and an apparatus for classifying color films. 4,422,752, Cl. 355-41.000.
Thurn, Carrol R., to FMC Corporation. Foundry pouring ladle protective liner. 4,422,625, Cl. 266-281.000.
Tickle, Andrew C., to Fairchild Camera & Instrument Corp. Self-refreshing memory cell. 4,423,491, Cl. 365-154.000.
Ticks, Gerd-Heinz: *See*—
Hamaekers, Arno; Ticks, Gerd-Heinz; and Rudolf, Hans-Joachim, 4,422,779, Cl. 384-99.000.
Tiebor, John E.: *See*—
Spongr, Jerry J.; Tiebor, John E.; and Joffe, Boris B., 4,423,328, Cl. 250-358.100.
Tiep, Brian L., to City of Hope National Medical Center. Nasal cannula structure. 4,422,456, Cl. 128-207.180.
Tippmer, Kurt: *See*—
Weber, Heinrich; Dungs, Horst; and Tippmer, Kurt, 4,422,857, Cl. 48-197.00R.
Weber, Heinrich; Dungs, Horst; and Tippmer, Kurt, 4,422,858, Cl. 48-197.00R.
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Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Onodera, Takashi; Komine, Kikuji; Ohashi, Fumis; and Naito, Tsutomu, 4,422,924, Cl. 208-33.000.
Toastess Inc.: *See*—
Solomon, Harry, 4,422,560, Cl. 220-377.000.
Tokico Ltd.: *See*—
Oshima, Harumi, 4,422,534, Cl. 188-73.380.
Toko Kogyo Co.Ltd.: *See*—
Fujihiro, Sanae; and Matuda, Sigeyaki, 4,422,278, Cl. 52-714.000.
Tokuda, Fuminori; and Nakashima, Yutaka, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,423,115, Cl. 428-425.900.
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Nunokawa, Kazuo, 4,422,736, Cl. 351-207.000.
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Hirose, Masahiko; and Nishida, Katsutoshi, 4,423,303, Cl. 219-121.00P.
Hosoya, Hisao; and Sato, Yukio, 4,422,863, Cl. 65-110.000.
Kageyama, Katsuhiro, 4,423,355, Cl. 315-111.810.
Koike, Norio; Takahara, Takeshi; Shirakawa, Yasuhiro; and Ikari, Kunihiro, 4,423,128, Cl. 430-28.000.
Komatsu, Shigeru, 4,423,434, Cl. 357-51.000.
Sugimori, Fumio; Nishino, Chikae; and Harao, Norio, 4,423,351, Cl. 313-523.000.
Tomy Kogyo Co., Inc.: *See*—
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Town, Michael H.: *See*—
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Toyo Jozo Kabushiki Kaisha: *See*—
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Komoda, Norio; Kobayashi, Nobuyuki; Itoh, Hiroshi; Nishimura, Yozi; and Obara, Shigenobu, 4,422,497, Cl. 165-23.000.
Sami, Hiroshi; Ito, Osamu; Kawai, Shizuo; Hobo, Nobuhito; Nishio, Teruo; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,423,485, Cl. 364-431.050.
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Trainor, Thomas M.; and Sullivan, Daniel R., to Central Soya Company, Inc. Process for preparing salad dressings. 4,423,084, Cl. 426-589.000.
TransFRESH Corporation: *See*—
Kuttel, Brian W., 4,422,304, Cl. 62-78.000.
Treadwell, William A., to Eaton Corporation. Vehicle speed control. 4,422,518, Cl. 180-175.000.
Trentman, John L., to Harris Corporation. Blade holder and method of using the same. 4,422,630, Cl. 270-53.000.
Trezeguet, Jean-Pierre; and Vives, Jean-Patrick, to Les Cables De Lyon. Method of manufacturing an optical fibre cable. 4,422,889, Cl. 156-70.000.
Tri Tool Inc.: *See*—
Pertle, John E., 4,422,356, Cl. 82-36.00R.
Trotta, Robert A., to Gillette Company, The. Razor handle. 4,422,237, Cl. 30-85.000.
Trottet, Pierre. Tiltable tennis court. 4,422,632, Cl. 272-3.000.
TRW Inc.: *See*—
Cromas, Joseph C.; and McQuillan, Charles M., 4,422,420, Cl. 123-352.000.
Drutchas, Gilbert H.; and Suttkus, David J., 4,422,834, Cl. 417-283.000.
Tsai, Tom, to Copolymer Rubber & Chemical Corporation. High green strength synthetic rubbers and method. 4,423,198, Cl. 526-263.000.
Tsao, Jung-Hsien; and Hein, Paul R., to W. R. Grace & Co. Polymer composition having terminal alkene and terminal carboxyl groups. 4,422,914, Cl. 204-159.190.
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Tsuge, Noboru: *See*—
Chiba, Masakazu; Kuwakado, Satosi; Takei, Toshihiro; Tsuge, Noboru; and Shimogawa, Toshiaki, 4,422,669, Cl. 280-806.000.
Tsugekawa, Takanori; Banba, Tosio; and Matsui, Masakuni, to Yanmar Diesel Engine Co., Ltd. Antechamber system diesel engine. 4,422,426, Cl. 123-470.000.
Tsuji, Masakazu: *See*—
Sugimori, Shigeru; Kojima, Tetsukiko; and Tsuji, Masakazu, 4,422,951, Cl. 252-299.630.
Tsujino, Masatoshi: *See*—
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Tsukioka, Kazumi: *See*—
Murayama, Tomio; Koguchi, Kenji; Takeuchi, Shigehumi; and Tsukioka, Kazumi, 4,423,520, Cl. 375-95.000.
Tsukushi, Masanori; Ohshita, Youichi; Hirasawa, Kunio; and Takahashi, Takeshi, to Hitachi, Ltd. Gas circuit breaker of resistance breaking type. 4,423,298, Cl. 200-144.0AP.
Tsunekawa, Tokuichi: *See*—
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Tucker, Richard B. C., to Wm. T. Burnett & Co., Inc. Golf putter. 4,422,638, Cl. 273-78.000.
Tuckett, Larry L.; and Kendall, Ronald L. Latch. 4,422,678, Cl. 292-264.000.
Turek, Gregory J., to Bell Telephone Laboratories, Incorporated. Detector circuit for communication lines. 4,423,292, Cl. 179-18.0FA.
Turiot, Andre, to Messier-Hispano-Bugatti (S.A.). Tripod type landing gear. 4,422,602, Cl. 244-102.00R.
Turiot, Andre; and Derrien, Michel, to Messier-Hispano-Bugatti (S.A.). Landing gear for aircraft. 4,422,603, Cl. 244-102.00R.
Turiot, Andre; and Derrien, Michel, to Messier-Hispano-Bugatti (S.A.). Fuselage landing gear with tandem wheels. 4,422,604, Cl. 244-102.00R.
Turner, James A., to Singer Company, The. Servo control circuit. 4,423,365, Cl. 318-561.000.
Tutherly, Herbert W.: *See*—
Stearns, Charles F.; and Tutherly, Herbert W., 4,422,287, Cl. 60-39.281.
TVI Energy Corporation: *See*—
Rosa, Stephen P., 4,422,646, Cl. 273-348.100.
Twardawa, Philip A.: *See*—
Couture, Joseph E. G.; and Twardawa, Philip A., 4,422,383, Cl. 102-364.000.
Twin City International Inc.: *See*—
Spongr, Jerry J.; Tiebor, John E.; and Joffe, Boris B., 4,423,328, Cl. 250-358.100.
Uchida, Kenichi: *See*—
Aoki, Akio; and Uchida, Kenichi, 4,422,698, Cl. 308-187.100.
Uchidoi, Masanori; and Urushihara, Kazunobu, to Canon Kabushiki Kaisha. Exposure time control device for camera. 4,422,747, Cl. 354-458.000.

Uchiyama, Takashi: *See—*
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Uede, Hisashi: *See—*
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Ueki, Yoshiharu; and Sakaguchi, Shouzaburou, to Pioneer Electronic Corporation. Automatic-reversing tape deck. 4,423,443, Cl. 360-74.100.

Ullman, Edwin F.: *See—*
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Davis, Robert B.; and Delano, Mark A., 4,422,302, Cl. 62-57.000.
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Fisch, Nathaniel J., 4,423,001, Cl. 376-123.000.
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Fischell, Robert E., 4,422,330, Cl. 73-517.00R.
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Perona, Brian J., 4,422,710, Cl. 339-177.00R.
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van Maanen, Johannes D., to Teuopharm-Schiedam B.V. Shaft having means for retaining thereon a reel, material roll or similar article. 4,422,591, Cl. 242-72.100.

Van Nette, Adair B., III, to Joseph B. Stinson Co. Mold handling system. 4,422,495, Cl. 164-324.000.

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Bini, Marco; Ignesti, Amleto; Millanta, Luigi; Rubino, Nicola; and Vanni, Riccardo, 4,423,372, Cl. 324-72.000.

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VDO Adolf Schindling AG: *See*—
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Goerner, Klaus; Dietze, Manfred; and Birkner, Rainer, 4,422,566, Cl. 226-191.000.

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Baumgartner, Friedrich; Romar, Alfred; and Rigles, Albert, 4,422,626, Cl. 266-281.000.

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Verheyden, Julien P. H.; and Martin, John C., to Syntex (U.S.A.) Inc. 9-(1,3-Dihydroxy-2-propoxymethyl)guanine as antiviral agent. 4,423,050, Cl. 424-253.000.

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Aspinwall, Ronald A., 4,422,475, Cl. 137-630.150.

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Victor Company of Japan, Ltd.: *See*—
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Vincent, Gary A.: *See*—
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Voest-Alpine Aktiengesellschaft: *See*—
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Schultz, William E.; and Vogl, Jeffrey S., 4,422,527, Cl. 182-92.000.

Vogl-Schultz, Incorporated: *See*—
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Vora, Bipin V.: *See*—
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Skuballa, Werner; Raduchel, Bernd; Schwarz, Norbert; Vorbruggen, Helmut; Casals-Stenzel, Jorge; Schillinger, Ekkehard; and Town, Michael H., 4,423,067, Cl. 424-305.000.

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Waddill, Harold G., to Texaco Inc. One component water reduced epoxy adhesives. 4,423,170, Cl. 523-417.000.

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Waite, Carlson A., to Sheffer Collet Company. Chuck with improved jaw actuator support structure. 4,422,655, Cl. 279-118.000.

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Walker, Clifford G. Phase modulator laser accelerometer. 4,422,331, Cl. 73-517.00B.

Walker, Frank H.; and Wolfe, Ordell L., to Stauffer Chemical Company. Control of houseflies by fumigant activity. 4,423,028, Cl. 424-40.000.

Walker, Keith A. M., to Syntex (U.S.A.) Inc. Methods of use of 1-[(substituted-naphthyl)ethyl]-imidazole derivatives. 4,423,057, Cl. 424-273.00R.

Walker, Ralph; and Bories, David, to Walker Ralph T. Automatic animal feeding apparatus. 4,422,409, Cl. 119-51.110.

Walker Ralph T.: *See*—
Walker, Ralph; and Bories, David, 4,422,409, Cl. 119-51.110.

Wallace, Edward M.; Gosselin, Robert G.; and Labarre, Ernest D., to Wallace Mgf. Corp. Cutting implements. 4,422,240, Cl. 30-254.000.

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Walser, Richard J.; and Wyant, Gary M., to Hall Company, The. Laminate switch assembly having improved durability. 4,423,294, Cl. 200-5.00A.

Wang, Anthony D.: *See*—
Naylor, Jimmy R.; Lillis, William J.; and Wang, Anthony D., 4,423,409, Cl. 340-347.0DA.

Wardlaw, William G., to Owens-Corning Fiberglas Corporation. Process for reusing scrap glass. 4,422,862, Cl. 65-28.000.

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Watanabe, Asao, to Canon Kabushiki Kaisha. Facsimile transmitter. 4,423,439, Cl. 358-287.000.

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Takasu, Yoshio; Sakai, Kiyoshi; Mabuchi, Minoru; Ishikawa, Shozo; and Watanabe, Katsunori, 4,423,129, Cl. 430-59.000.

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Watt, Robert H.; Ladd, Richard H.; and Wright, Walter S., deceased (by Fleischack, Albert C., administrator), to Watt, Robert H.; Hastie, William F.; and Wright, Walter Stockdale. Evaporative loss reduction. 4,422,301, Cl. 62-54.000.

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Webb, Gerald F., to Northern Telecom Limited. Modular telephone jack. 4,423,288, Cl. 339-176.00M.

Webb, William, Jr. Solar energy control system and method. 4,422,444, Cl. 126-422.000.

Weber, Erhard: *See—*
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Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst, to Carl Still GmbH & Co. KG, Firma. Method and apparatus for indirectly drying and preheating fine material. 4,422,846, Cl. 432-18.000.

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Webster, Donald R., to Pacific Scientific Instruments Company. Optical analyzing instrument having vibrating trough. 4,422,760, Cl. 356-244.000.

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Weir, Donald R.; Masters, Ian M.; and Neven, Manfred, to Sherritt Gordon Mines Limited. Removal of radium from aqueous sulphate solutions. 4,423,007, Cl. 423-2.000.

Weirich, Walter: *See—*
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Weitz, Henry. Connectors for assembling component parts of artificial plants. 4,423,098, Cl. 428-17.000.

Welch, Charles W., to Du Pont de Nemours, E. I., and Company. Zinc plating. 4,422,908, Cl. 204-55.00R.

Welebir, Andrew J., to National Foundation for Cancer Research, Inc. 5,6,-0-Isoalkylidene ascorbic acid derivatives. 4,423,236, Cl. 549-320.000.

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Werkheiser, James S., to Harris Graphics Corporation. Apparatus for stabilizing layers of newspapers on a movable pallet. 4,422,549, Cl. 206-386.000.

Werner, Karl-Heinz, to Fichtel & Sachs AG. Clutch disk. 4,422,539, Cl. 192-107.00C.

West, Neil L., to Deere & Company. Rotor for an axial flow rotary separator. 4,422,463, Cl. 130-27.0HA.

Western Automation Corporation: *See—*
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Westfalische Metall Industrie KG Hueck & Co.: *See—*
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Freitag, Ronald G.; and Kruth, Jeffrey A., 4,423,393, Cl. 333-164.000.
Pack, John L.; Williams, Roy K.; and Liu, Chi-Sheng, 4,423,510, Cl. 372-82.000.
Ramsey, James E., Jr.; and Griffin, Auburn K., Jr., 4,423,375, Cl. 324-137.000.

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Wetzig, Werner: *See—*
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Weyer, Paul P. Rotary helical actuator. 4,422,366, Cl. 91-26.000.

Wheeler, Thomas N., to Union Carbide Corporation. Biocidal 2-aryl-1, 3-cyclohexanedione enol ester compounds. 4,422,870, Cl. 71-106.000.

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Nordeen, Erwin E., 4,422,702, Cl. 339-15.000.

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Whitehouse, Oliver D. Geodesic dome-type building structure. 4,422,267, Cl. 52-81.000.

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Wiart, Albert; Defaucheux, Jacques; Pasqualini, Gilbert; and Martin, Jean, to Framatome. Apparatus for controlling a nuclear reactor by vertical displacement of a unit absorbing neutrons. 4,423,002, Cl. 376-227.000.

Wiatrak, Wieslaw, to Osrodek Badawczo-Rozwojowy Samochodow Malolitrazowych Bosmal. Method and a system for the creation of turbulence and gasification of the air-fuel mixture. 4,422,430, Cl. 123-568.000.

Wicks, Anthony J., to Wicks and Wilson Limited. Data storage cards and method of handling thereof. 4,422,252, Cl. 40-159.000.

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# LIST OF REISSUE PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 27TH DAY OF DECEMBER, 1983

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Gorez, Jean-Philippe, to Compagnie Generale des Etablissements Michelin. Tire. 271,959, 12-27-83, Cl. D12-147.000.

Gorez, Jean-Philippe, to Compagnie Generale des Etablissements Michelin. Tire. 271,960, 12-27-83, Cl. D12-147.000.

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Nanba, Masumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Compact fluorescent lamp. 271,999, 12-27-83, Cl. D26-3.000.

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Neil, Andrew M. Planter. 271,955, 12-27-83, Cl. D11-156.000.

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Thompson, Robert V. Table. 271,923, 12-27-83, Cl. D6-177.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
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Nanba, Masumi; Kojima, Yoshio; and Umehara, Nobuhiro, 271,996, Cl. D26-3.000.
Nanba, Masumi; Kojima, Yoshio; and Umehara, Nobuhiro, 271,998, Cl. D26-3.000.
Nanba, Masumi, 271,999, Cl. D26-3.000.
Nanba, Masumi; Kojima, Yoshio; and Umehara, Nobuhiro, 272,000, Cl. D26-3.000.
Nanba, Masumi, 272,001, Cl. D26-3.000.
Umehara, Nobuhiro; Kojima, Yoshio; and Nanba, Masumi, 272,002, Cl. D26-3.000.
Tong, King Sing: *See*—
Cheung, Kwok K., 272,007, Cl. D28-83.000.
Tong, Wing Kiu: *See*—
Cheung, Kwok K., 272,007, Cl. D28-83.000.
Topete, Lino Z. Combined hydrotherapy spa and swimming pool. 271,995, 12-27-83, Cl. D24-38.000.
Tyler, Daniel W.: *See*—
Genaro, Donald M.; Kowalik, John, Jr.; McGarvey, John N.; Sylvester, Gordon E.; and Tyler, Daniel W., 271,972, Cl. D14-60.000.
Umehara, Nobuhiro; Kojima, Yoshio; and Nanba, Masumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Compact fluorescent lamp. 272,002, 12-27-83, Cl. D26-3.000.
Umehara, Nobuhiro: *See*—
Kamei, Taketo; Osada, Kimio; Nanba, Masumi; Umehara, Nobuhiro; and Kojima, Yoshio, 271,997, Cl. D26-3.000.
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Nanba, Masumi; Kojima, Yoshio; and Umehara, Nobuhiro, 272,000, Cl. D26-3.000.
U.S. Philips Corporation: *See*—
Jankowski, Michael T., 272,003, Cl. D26-63.000.
United States Surgical Corporation: *See*—
Noiles, Douglas G.; Rawson, Paul O.; and Yagami, Richard, 271,994, Cl. D24-26.000.
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Walker, Jimmie: *See*—
Nelson, Jules; Walker, Jimmie; Rossi, Joseph J.; and Leotta, Samuel S., 271,984, Cl. D20-10.000.
Wood, Prentice J., to Mead Corporation, The. Article carrier. 271,944, 12-27-83, Cl. D9-416.000.
Yagami, Richard: *See*—
Noiles, Douglas G.; Rawson, Paul O.; and Yagami, Richard, 271,994, Cl. D24-26.000.
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Morioka, Minoru; Matsui, Mamoru; and Yasuda, Michihiko, 271,956, Cl. D12-110.000.
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Meyer, John D.; and Yuill-Thornton II, Alexander, 271,967, Cl. D14-34.000.
501 Kyotaru Co., Ltd.: *See*—
Uno, Koki, 271,914, Cl. D1-2.000.

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Armstrong Nurseries, Inc.: *See*—
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NOTE—First number, class; second number, subclass; third number, patent number

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420.2 4,422,189
420.3 4,422,190
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**CLASS 8**

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104 A 4,422,201
106 4,422,202
150 4,422,203
210 B 4,422,204
222 4,422,205
236 R 4,422,206
250.42 4,422,207
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68 CT 4,422,218
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421 4,422,220
434 4,422,221
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**CLASS 26**

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**CLASS 29**

25.35 4,422,226
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148.3 4,422,228
156.8 H 4,422,229
434 4,422,230
509 4,422,231
564.2 4,422,232
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597 4,422,234
749 4,422,235
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101 4,422,238
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**CLASS 33**

1 BB 4,422,241
181 AT 4,422,242
366 4,422,243
367 4,422,244
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9 4,422,246
48 4,422,247

**CLASS 36**

121 4,422,248
133 4,422,249

**CLASS 38**

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**CLASS 40**

159 4,422,252
453 4,422,253

**CLASS 42**

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69 R 4,422,255
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**CLASS 43**

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18.1 4,422,259
44.8 4,422,260

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63 4,422,856

**CLASS 46**

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189 4,422,262
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197 R 4,422,857
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**CLASS 49**

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81 4,422,267
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100 4,422,269
182 4,422,270
302 4,422,271
311 4,422,272
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410 4,422,274
509 4,422,275
511 4,422,276
584 4,422,277
714 4,422,278
741 4,422,279
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**CLASS 53**

134 4,422,281
374 4,422,282

**CLASS 55**

16 4,422,859
67 4,422,860
498 4,422,861

**CLASS 56**

320.2 4,422,283
328 R 4,422,284

**CLASS 57**

31 4,422,285
221 4,422,286

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39.281 4,422,287
4,422,289
39.32 4,422,288
404 4,422,290
517 4,422,291
525 4,422,292
547.1 4,422,293
565 4,422,294
605 4,422,295
606 4,422,296
651 4,422,297
655 4,422,298
681 4,422,299
757 4,422,300

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57 4,422,302
63 4,422,303
78 4,422,304
430 4,422,305

**CLASS 63**

1 R 4,422,306

**CLASS 65**

28 4,422,862
110 4,422,863

**CLASS 66**

172 E 4,422,307

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13 R 4,422,308
16 4,422,309

**CLASS 69**

19.3 4,422,310

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25 4,422,311
133 4,422,312
167 4,422,313
242 4,422,314
456 R 4,422,315
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88 4,422,864
90 4,422,865
92 4,422,866
98 4,422,868
094 4,422,867
100 4,422,869
106 4,422,870
120 4,422,871

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200 4,422,318

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4,422,320
35 4,422,321
105 4,422,322
116 4,422,323
266 4,422,324
273 4,422,325
303 4,422,327
313 4,422,328
382 R 4,422,329
517 B 4,422,331
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660 4,422,333
665 4,422,334
724 4,422,335
769 4,422,336
861.17 4,422,337
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409 4,422,344
471 XY 4,422,345
493 4,422,346
574 4,422,347
579 E 4,422,348
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753 4,422,350
798 4,422,351
813 L 4,422,352
858 4,422,353
860 4,422,354

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243 4,422,875

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3.36 4,422,355

**CLASS 82**

36 R 4,422,356

**CLASS 83**

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356.3 4,422,358
546 4,422,359

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1.11 4,422,360
1.18 4,422,361
1.19 4,422,362
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4,422,364
384 4,422,365
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**CLASS 91**

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**CLASS 92**

105 4,422,368

**CLASS 98**

11.5 SB 4,422,370
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**CLASS 99**

323.1 4,422,371
353 4,422,372

**CLASS 100**

88 4,422,373
4,422,374
210 4,422,375

**CLASS 101**

69 4,422,376
93.29 4,422,377

**CLASS 102**

202.2 4,422,381
206 4,422,378
4,422,379
313 4,422,380
331 4,422,382
364 4,422,383

**CLASS 105**

29 R 4,422,384

**CLASS 106**

104 4,422,876
122 4,422,877
219 4,422,878
238 4,422,879
288 B 4,422,880

**CLASS 108**

153 4,422,385

**CLASS 109**

59 R 4,422,386

**CLASS 110**

173 R 4,422,387
261 4,422,388
264 4,422,389
341 4,422,390
347 4,422,391

**CLASS 111**

52 4,422,392
67 A 4,422,402

**CLASS 112**

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158 F 4,422,394
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261 4,422,396
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320 4,422,398

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73 4,422,400
294 4,422,401

**CLASS 118**

63 4,422,403
315 4,422,404
658 4,422,405
719 4,422,406
723 4,422,407

**CLASS 119**

3 4,422,408
51.11 4,422,409

**CLASS 122**

4 D 4,422,410
7 R 4,422,411

**CLASS 123**

3 4,422,412
25 J 4,422,413
48 B 4,422,414
52 M 4,422,415
52 MF 4,422,416
185 BA 4,422,417
198 D 4,422,418
235 4,422,419
352 4,422,420
424 4,422,421
425 4,422,422
438 4,422,423
447 4,422,424
450 4,422,425
470 4,422,426
478 4,422,427
502 4,422,428
557 4,422,429
568 4,422,430
4,422,431
592 4,422,432

**CLASS 124**

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**CLASS 126**

25 B 4,422,435
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120 4,422,438
123 4,422,439
292 4,422,440
299 C 4,422,441
390 4,422,442
418 4,422,443
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426 4,422,445
438 4,422,434
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46.1 4,422,881

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62 A 4,422,450
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75 4,422,452
80 G 4,422,453
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4,422,455
207.18 4,422,456
303.1 4,422,457
671 4,422,458
702 4,422,459
786 4,422,460
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**CLASS 130**

27 AA 4,422,462
27 HA 4,422,463

**CLASS 132**

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76.4 4,422,465

**CLASS 134**

22.18 4,422,882
38 4,422,883
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**CLASS 135**

36 TP 4,422,467
97 4,422,468

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315 4,422,469
484.2 4,422,470
561 A 4,422,471
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614.06 4,422,472
625.32 4,422,473
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**CLASS 139**

1 R 4,422,479
66 R 4,422,480
88 4,422,481
188 R 4,422,482
420 R 4,422,483
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**CLASS 141**

98 4,422,485

**CLASS 144**

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245 R 4,422,487
368 4,422,488

**CLASS 145**

46 4,422,489

**CLASS 148**

1.5 4,422,885
2 4,422,884
11.5 R Re.31,474
31.5 4,422,886
133 4,422,887
175 4,422,888

**CLASS 152**

394 4,422,490

**CLASS 156**

62.2 4,422,894
70 4,422,889
73.5 4,422,890
89 4,422,891
209 4,422,892
232 4,422,893
633 4,422,895
643 4,422,896
4,422,897
655 4,422,898

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13 B 4,422,899
48.1 4,422,900

**CLASS 160**

58 R 4,422,491
84 R 4,422,492
133 4,422,493

**CLASS 164**

80 4,422,494
324 4,422,495
528 4,422,496

**CLASS 165**

23 4,422,497
47 4,422,498
71 4,422,499
104.12 4,422,500
104.26 4,422,501
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53 4,422,503
241 4,422,504
256 4,422,505
324 4,422,506
348 4,422,507
376 4,422,508

**CLASS 168**

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**CLASS 172**

21 4,422,510
260.5 4,422,511
454 4,422,512

**CLASS 173**

291 4,422,326

**CLASS 174**

36 4,423,282

47 4,423,283
101 4,423,284
115 Re.31,477
146 4,423,285

**CLASS 175**

17 4,422,513
213 4,422,514

**CLASS 178**

19 4,423,286
22.08 4,423,287

**CLASS 179**

18 FA 4,423,292
156 R 4,423,293

**CLASS 180**

6.5 4,422,515
70 R 4,422,516
127 4,422,517
175 4,422,518
219 4,422,519
247 4,422,520
271 4,422,521
281 4,422,522

**CLASS 181**

211 4,422,523
215 4,422,524
255 4,422,525

**CLASS 182**

36 4,422,526
92 4,422,527
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15 R 4,422,529

**CLASS 185**

29 4,422,530

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20 4,422,531

**CLASS 188**

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71.4 4,422,533
73.38 4,422,534

**CLASS 192**

3.28 4,422,535
3.57 4,422,536
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70.14 4,422,538
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14.52 4,422,901

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735 4,422,542
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**CLASS 200**

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339 4,423,300

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158 HA 4,422,913
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270 4,422,919
290 R 4,422,920
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45.34 4,422,545
77.1 4,422,546
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370 4,422,548
386 4,422,549
387 4,422,550
461 4,422,551
466 4,422,552
528 4,422,553

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8 LE 4,422,922
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4,422,924
75 4,422,925
86 4,422,926
211 4,422,927

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166 4,422,928

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150 4,422,930
159 B 4,423,299
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186 4,422,932
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4,422,934
223 4,422,935
321.4 4,422,936
409 4,422,937
411 4,422,938
445 4,422,939
631 4,422,940
657 4,422,941
659 4,422,942
716 4,422,943
736 4,422,944
764 4,422,945
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**CLASS 211**

1.5 4,422,554
74 4,422,555
119 4,422,556

**CLASS 213**

62 R 4,422,557

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68 4,423,301
69 G 4,423,302
121 EU 4,423,305
121 LK Re.31,478
121 P 4,423,303
121 PM 4,423,304
137.9 4,423,306
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217 4,423,308
270 4,423,309
285 4,423,310
306 4,423,311
388 4,423,312

**CLASS 220**

1.5 4,422,558
306 4,422,559
377 4,422,560
461 4,422,561

**CLASS 222**

55 4,422,562
153 4,422,563

**CLASS 223**

99 4,422,564

**CLASS 226**

97 4,422,565
191 4,422,566

**CLASS 227**

19 4,422,567

**CLASS 228**

111 4,422,568
173 C 4,422,569

**CLASS 229**

17 R 4,422,570

**CLASS 235**

377 4,423,314
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379 4,423,313
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482 4,423,320
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12.3 B 4,422,572
70 4,422,573

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118 4,422,574
562 4,422,575
693 4,422,576
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39 4,422,579
46.11 4,422,580
66 4,422,581
82.5 4,422,582

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55.3 4,422,584
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68.3 4,422,590
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107.2 4,422,593
107.4 A 4,422,594
116 4,422,595
129 4,422,596
130 4,422,597
192 4,422,598
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217 4,422,600

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3.13 4,422,601
102 R 4,422,602
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281 4,422,604
110 B 4,422,605
203 4,422,606

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205 A 4,422,608
228 4,422,609
311.2 4,422,610
421 4,422,611
430 4,422,612
473 4,422,613
475 R 4,422,614
4,422,615
544 4,422,616

**CLASS 249**

19 4,422,617

**CLASS 250**

229 4,423,322
264 4,423,323
281 4,423,324
332 4,423,325
339 4,423,326
358.1 4,423,327
4,423,328
374 4,423,329
551 4,423,330
572 4,423,331

**CLASS 251**

58 4,422,618
130 4,422,619

**CLASS 252**

8.5 C 4,422,947
8.5 LC 4,422,948
8.8 4,422,949
186.38 4,422,950
299.63 4,422,951
309 4,422,952
392 4,422,953
578 4,422,962
583 4,422,963
628 4,422,964
629 4,422,965

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26 E 4,422,620
30 4,422,621

**CLASS 256**

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97.6 4,422,966
112.5 E 4,422,968
112.5 T 4,422,967
152 4,422,969
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245.2 R 4,422,971
368 4,422,972
382 4,422,973
397.25 4,422,974
448 AD 4,422,975
453 PH 4,422,976
455 R 4,422,977
465 D 4,422,978
4,422,979
465.8 D 4,422,980
4,422,981
502.5 F 4,422,982

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24 4,422,983
44 B Re.31,475

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2.1 4,422,984
4.4 4,422,985
16 Re.31,476
39 4,422,986
40.1 4,422,987
40.3 4,422,988
42 4,422,989
45.3 4,422,990
83 4,422,991
108 4,422,992
210.8 4,422,993
219 4,422,994
250 4,422,995
255 4,422,996
261 4,422,997
335 4,422,998
339 4,422,999
524 4,423,000

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109 4,422,623
182 4,422,624
281 4,422,625
4,422,626

**CLASS 267**

148 4,422,627

**CLASS 269**

71 4,422,628
282 4,422,629

**CLASS 270**

53 4,422,630

**CLASS 271**

9 4,422,631

**CLASS 272**

3 4,422,632
8 N 4,422,633
71 4,422,634
96 4,422,635
117 4,422,636

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94 4,422,639
148 R 4,422,640
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157 R 4,422,642
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249 4,422,644
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4,422,646
411 4,422,647

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75 4,422,649
88 4,422,650
206 R 4,422,651

**CLASS 279**

1 M 4,422,652
2 A 4,422,653
4 4,422,654
118 4,422,655

**CLASS 280**

3 4,422,656
21 R 4,422,657
47.4 4,422,658
152.1 4,422,659
242 WC 4,422,660
276 4,422,661
4,422,662
278 4,422,663
414.1 4,422,664
414.2 4,422,665
694 4,422,666
705 4,422,667
804 4,422,668
806 4,422,669

**CLASS 282**

27.5 4,422,670
4,422,671

**CLASS 283**

39 4,422,672

**CLASS 285**

23 4,422,673
30 4,422,674
45 4,422,675
136 4,422,676

**CLASS 290**

44 4,423,333
45 4,423,332
53 4,423,334

**CLASS 292**

139 4,422,677
264 4,422,678
307 R 4,422,679

**CLASS 293**

122 4,422,680

**CLASS 294**

1 BA 4,422,681
19 R 4,422,682
86 LS 4,422,683
97 4,422,684

**CLASS 296**

197 4,422,685
219 4,422,686
221 4,422,687
224 4,422,688
4,422,689

**CLASS 297**

341 4,422,690
440 4,422,691

**CLASS 301**

37 SS 4,422,692

**CLASS 303**

24 A 4,422,693
84 A 4,422,694
115 4,422,695

**CLASS 305**

28 4,422,696

**CLASS 307**

31 4,423,335
64 4,423,336
247 R 4,423,337
273 4,423,338
464 4,423,339
530 4,423,340
570 4,423,341

**CLASS 308**

175 4,422,697
187.1 4,422,698

**CLASS 310**

41 4,423,342
49 R 4,423,343
68 E 4,423,346
105 4,423,344
153 4,423,345
331 4,423,347

**CLASS 313**

113 4,423,348
487 4,423,349
493 4,423,350
523 4,423,351
584 4,423,352
631 4,423,353

**CLASS 315**

12 R 4,423,354
111.81 4,423,355
169.2 4,423,356
307 4,423,357
371 4,423,358

**CLASS 318**

6 4,423,359
85 4,423,360
135 4,423,361
139 4,423,362
375 4,423,363
440 4,423,364
561 4,423,365
696 4,423,366
803 4,423,367

**CLASS 322**

35 4,423,368

**CLASS 323**

303 4,423,369
315 4,423,370

**CLASS 324**

61 R 4,423,371
72 4,423,372
72.5 4,423,373
73 R 4,423,380
86 4,423,374
137 4,423,375
158 P 4,423,376
329 4,423,377
427 4,423,378
429 4,423,379

**CLASS 328**

14 4,423,381
55 4,423,382
63 4,423,383
152 4,423,384

**CLASS 330**

9 4,423,385
54 4,423,386
85 4,423,387
277 4,423,388
297 4,423,389

**CLASS 331**

4 4,423,390

**CLASS 333**

28 R 4,423,391
116 4,423,392
164 4,423,393
192 4,423,394
193 4,423,395
204 4,423,396
219 4,423,397
229 4,423,398

**CLASS 335**

202 4,423,399

**CLASS 337**

72 4,423,400
107 4,423,401
323 4,423,402

**CLASS 338**

15 4,423,403
21 4,423,404
25 4,423,405
32 R 4,423,406
34 4,423,407

**CLASS 339**

3 S 4,422,699
14 R 4,422,700
4,422,701
15 4,422,702
74 R 4,422,703
91 R 4,422,704
103 M 4,422,705
107 4,422,706
143 R 4,422,707
176 M 4,423,288
176 MF 4,422,709
176 MP 4,422,708
177 R 4,422,710
223 S Re.31,472
252 R 4,422,711
255 R 4,422,712

**CLASS 340**

347 DA 4,423,409
347 NT 4,423,408
525 4,423,410
629 4,423,411
661 4,423,412
825.03 4,423,413
825.07 4,423,414
825.34 4,423,415
825.52 4,423,416
870.37 4,423,417

**CLASS 343**

17.7 4,423,418
387 4,423,419
400 4,423,420
771 4,423,421
786 4,423,422
803 4,423,423

**CLASS 346**

76 PH 4,423,424
4,423,425
108 4,423,426
135.1 4,423,427
139 C 4,423,428
140 R 4,423,429

**CLASS 350**

3.61 4,422,713
96.15 4,422,714
96.20 4,422,715
96.21 4,422,716
4,422,717
96.23 4,422,718
96.30 4,422,719
138 4,422,720
164 4,422,721
173 4,422,722
295 4,422,723
307 4,422,724
310 4,422,725
331 R 4,422,726
334 4,422,727
4,422,728
336 4,422,729
339 R 4,422,730
344 4,422,731
356 4,422,732
413 4,422,733
422 4,422,734

**CLASS 351**

206 4,422,735
207 4,422,736

**CLASS 352**
39 4,422,737

**CLASS 353**
11 4,422,738

**CLASS 354**
25 4,422,740
105 4,422,745
195.12 4,422,746
316 4,422,748
403 4,422,741
404 4,422,739
413 4,422,742
4,422,744
415 4,422,743
458 4,422,747

**CLASS 355**
3 DD 4,422,749
4,422,750
14 SH 4,422,751
41 4,422,752
43 4,422,753
4,422,754
4,422,755
57 4,422,756

**CLASS 356**
138 4,422,757
152 4,422,758
243 4,422,759
244 4,422,760
338 4,422,761
350 4,422,762
356 4,422,763
357 4,422,764
432 4,422,765
445 4,422,766

**CLASS 357**
5 4,423,430
41 4,423,431
45 4,423,432
51 4,423,433
4,423,434
65 4,423,435

**CLASS 358**
98 4,423,436
113 4,423,437
231 4,423,438
287 4,423,439
335 4,423,440

**CLASS 360**
13 4,423,441
68 4,423,442
74.1 4,423,443
79 4,423,444
96.5 4,423,445
106 4,423,446
4,423,447
4,423,448
4,423,449
111 4,423,450
125 4,423,451
131 4,423,452
4,423,453
135 4,423,454
137 4,423,455

**CLASS 361**
77 4,423,456
86 4,423,457
93 4,423,458
94 4,423,459
151 4,423,460
235 4,423,461
4,423,462
275 4,423,463
288 4,423,464
394 4,423,465
400 4,423,466
403 4,423,467
404 4,423,468

**CLASS 362**
2 4,423,469
17 4,423,470
96 4,423,471
184 4,423,472
186 4,423,473
223 4,423,474
249 4,423,475

**CLASS 363**
20 4,423,476
54 4,423,477
89 4,423,478

**CLASS 364**
200 4,423,479
4,423,480
4,423,482
4,423,483
420 4,423,484
431.05 4,423,485
466 4,423,486
474 4,423,481
551 4,423,487
724 4,423,488

**CLASS 365**
12 4,423,489
149 4,423,490
154 4,423,491
226 4,423,492
233 4,423,493

**CLASS 366**
40 4,422,767
110 4,422,768
178 4,422,769
248 4,422,770
251 4,422,771
287 4,422,772
341 4,422,773
347 4,422,774

**CLASS 367**
123 4,423,494

**CLASS 368**
74 4,422,775
185 4,422,776
4,422,777

**CLASS 369**
45 4,423,495
46 4,423,496
47 4,423,497
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230 4,423,500
253 4,423,501
275 4,423,502
290 4,423,503
292 4,423,504

**CLASS 370**
32 4,423,505
85 4,423,506
89 4,423,507

**CLASS 371**
16 4,423,508
25 4,423,509

**CLASS 372**
82 4,423,510
95 4,423,511

**CLASS 373**
22 4,423,512
76 4,423,513
79 4,423,514
81 4,423,515
111 4,423,516

**CLASS 374**
135 4,422,778

**CLASS 375**
1 4,423,517
20 4,423,518
80 4,423,519
95 4,423,520

**CLASS 376**
123 4,423,001
227 4,423,002
290 4,423,003

**CLASS 378**
87 4,423,522
108 4,423,521

**CLASS 381**
43 4,423,291
51 4,423,290
71 4,423,289

**CLASS 384**
99 4,422,779
215 4,422,780

**CLASS 400**
18 4,422,781
56 4,422,782
128 4,422,783
144.2 4,422,784
208 4,422,785
229 4,422,786
621 4,422,787

**CLASS 401**
188 R 4,422,788
218 4,422,789

**CLASS 403**
11 4,422,790
39 4,422,791
232.1 4,422,792
261 4,422,793
330 4,422,794

**CLASS 404**
124 4,422,795
128 4,422,796

**CLASS 405**
70 4,422,797
132 4,422,798
158 4,422,799
184 4,422,800
195 4,422,801
198 4,422,802
204 4,422,803
210 4,422,804
225 4,422,805
227 4,422,806
296 4,422,807
302 4,422,808

**CLASS 406**
98 4,422,809
156 4,422,810

**CLASS 408**
204 4,422,811
4,422,812

**CLASS 411**
38 4,422,813

**CLASS 414**
222 4,422,815
303 4,422,814
331 4,422,816
421 4,422,817
712 4,422,818
724 4,422,819

**CLASS 415**
4 4,422,820
89 4,422,821
90 4,422,822
199.5 4,422,823

**CLASS 416**
5 4,422,824
132 B 4,422,825
135 4,422,828
157 R 4,422,826
193 A 4,422,827

**CLASS 417**
40 4,422,829
54 4,422,830
63 4,422,831
68 4,422,832
183 4,422,833
283 4,422,834
401 4,422,835

**CLASS 418**
56 4,422,836

**CLASS 419**
35 4,423,004

**CLASS 422**
61 4,423,005
109 4,423,006

**CLASS 423**
2 4,423,007
7 4,423,008
15 4,423,009
4,423,010
22 4,423,011
49 4,423,012
55 4,423,013
139 4,423,014
167 4,423,015
170 4,423,016
235 4,423,017
243 4,423,018
244 4,423,019
277 4,423,020
333 4,423,021
360 4,423,022
376 4,423,023
437 4,423,024
578 R 4,423,025
636 4,423,026

**CLASS 424**
16 4,423,027
40 4,423,028
54 4,423,029
58 4,423,030
63 4,423,031
70 4,423,032
80 4,423,033
85 4,423,034
92 4,423,035
105 4,423,036
177 4,423,037
4,423,038
178 4,423,039
180 4,423,040
184 4,423,041
200 4,423,042
229 4,423,043
244 4,423,044
246 4,423,045
248.4 4,423,046
251 4,423,047
4,423,048
4,423,049
253 4,423,050
263 4,423,051
266 4,423,052
269 4,423,053
270 4,423,054
4,423,055
4,423,056
273 P 4,423,058
273 R 4,423,057
274 4,423,059
4,423,060
4,423,061
275 4,423,062
278 4,423,063
304 4,423,064
4,423,065
305 4,423,066
4,423,067
4,423,068
310 4,423,069
311 4,423,070
4,423,071
312 4,423,072
314 4,423,073
317 4,423,074
4,423,075
322 4,423,076
325 4,423,077

**CLASS 425**
6 Re.31,473
289 4,422,837
376 A 4,422,838
465 4,422,839
472 4,422,840
525 4,422,843
548 4,422,841
561 4,422,842

**CLASS 426**
20 4,423,078
4,423,079
124 4,423,080
271 4,423,081
557 4,423,082
574 4,423,083
589 4,423,084
632 4,423,085

**CLASS 427**
3 4,423,086
79 4,423,087
138 4,423,088
171 4,423,089
181 4,423,090
213.34 4,423,091
316 4,423,092
385.5 4,423,093
386 4,423,094
387 4,423,095
397.7 4,423,096
423 4,423,097

**CLASS 428**
17 4,423,098
35 4,423,099
42 4,423,100
76 4,423,101
92 4,423,102
95 4,423,103
101 4,423,104
198 4,423,105
207 4,423,106
266 4,423,108
288 4,423,109
304.4 4,423,110
383 4,423,111
389 4,423,112
4,423,113
403 4,423,114
411 4,423,116
425.9 4,423,115
475.8 4,423,117
514 4,423,118
558 4,423,119
614 4,423,120

**CLASS 429**
19 4,423,121
45 4,423,122
160 4,423,123
194 4,423,124
4,423,125

**CLASS 430**
9 4,423,126
22 4,423,127
28 4,423,128
59 4,423,129
4,423,130
4,423,131
67 4,423,132
95 4,423,133
103 4,423,134
271 4,423,135
281 4,423,136
320 4,423,137
326 4,423,138
338 4,423,139
445 4,423,140
454 4,423,141
504 4,423,142

**CLASS 431**
72 4,422,844
153 4,422,845

**CLASS 432**
18 4,422,846
28 4,422,847
118 4,422,848

**CLASS 433**
3 4,422,849

**CLASS 434**
45 4,422,851
98 4,422,850
178 4,422,852

**CLASS 435**
7 4,423,143
15 4,423,144
32 4,423,145
55 4,423,146
68 4,423,147
76 4,423,148
105 4,423,149
193 4,423,150

**CLASS 436**
8 4,423,151
56 4,423,152
63 4,423,153
505 4,423,154

**CLASS 502**
25 4,422,954
38 4,423,155
158 4,422,956
169 4,422,955
177 4,422,957
206 4,422,960
217 4,422,958
247 4,422,959
301 4,422,961

**CLASS 518**
717 4,423,156

**CLASS 521**
27 4,423,157
32 4,423,158
35 4,423,159
59 4,423,160
73 4,423,161
164 4,423,162
181 4,423,163

**CLASS 523**
135 4,423,164
409 4,423,165
414 4,423,166
4,423,167
4,423,168
4,423,169
417 4,423,170
454 4,423,171
4,423,172

**CLASS 524**
14 4,423,173
99 4,423,174
100 4,423,175
153 4,423,176
251 4,423,177
287 4,423,178
367 4,423,182
394 4,423,180
425 4,423,181
539 4,423,179
546 4,423,183

**CLASS 525**
57 4,423,184
66 4,423,185
4,423,186
68 4,423,187
71 4,423,188
92 4,423,189
98 4,423,190
169 4,423,191
199 4,423,192
296 4,423,193
327.6 4,423,194
479 4,423,195

**CLASS 526**
72 4,423,196
220 4,423,197
263 4,423,198
307.6 4,423,199

**CLASS 528**
67 4,423,200
76 4,423,201
179 4,423,202
266 4,423,203
323 4,423,204
371 4,423,205
416 4,423,206
499 4,423,207

**CLASS 536**
5 4,423,208
7.1 4,423,209
16.1 4,423,210
16.9 4,423,211
23 4,423,212

**CLASS 544**
16 4,423,213
22 4,423,214
025 4,423,215
192 4,423,216
267 4,423,217
277 4,423,218
326 4,423,219

**CLASS 546**
22 4,423,220
74 4,423,221
337 4,423,222

**CLASS 548**
163 4,423,223
252 4,423,224
373 4,423,225
402 4,423,226
406 4,423,227
421 4,423,228
4,423,229
433 4,423,230
451 4,423,231
472 4,423,232

**CLASS 549**
58 4,423,233
80 4,423,234
229 4,423,235
320 4,423,236
362 4,423,237
368 4,423,238
541 4,423,239

**CLASS 556**
460 4,423,240

**CLASS 560**
35 4,423,241
41 4,423,242
124 4,423,243

**CLASS 562**
416 4,423,245
466 4,423,244

**CLASS 564**
102 4,423,246
391 4,423,247

**CLASS 568**
324 4,423,248
655 4,423,249
678 4,423,250
697 4,423,251
728 4,423,252
756 4,423,253
781 4,423,254
808 4,423,255
886 4,423,256
902 4,423,257
4,423,258

**CLASS 570**
144 4,423,259
147 4,423,260
150 4,423,261
193 4,423,262
197 4,423,263

**CLASS 585**
255 4,423,264
322 4,423,265
481 4,423,266
531 4,423,267
533 4,423,268
4,423,269
626 4,423,281
639 4,423,270
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640 4,423,272
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645 4,423,275
665 4,423,276
719 4,423,277
823 4,423,278
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829 4,423,280

## CLASSIFICATION OF DESIGNS

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D1— | 2 | 271,914 | | 34 | 271,930 | D10— | 38 | 271,946 | | 182 | 271,962 | | 147 | 271,978 | | 26 | 271,994 |
| D2— | 29 | 271,915 | | 36 | 271,931 | | 62 | 271,947 | | 194 | 271,963 | D16— | 33 | 271,979 | | 38 | 271,995 |
| D3— | 40 | 271,916 | | 38 | 271,932 | | 79 | 271,948 | | 307 | 271,964 | | 35 | 271,980 | D26— | 3 | 271,996 |
| | | 271,917 | | 39 | 271,933 | | 106 | 271,949 | D13— | 24 | 271,965 | D19— | 86 | 271,981 | | | 271,997 |
| | 73 | 271,918 | | | 271,934 | | 130 | 271,950 | | 32 | 271,966 | D20— | 5 | 271,982 | | | 271,998 |
| | 74 | 271,919 | | 332 | 271,935 | D11— | 4 | 271,951 | D14— | 34 | 271,967 | | | 271,983 | | | 271,999 |
| D6— | 28 | 271,920 | D8— | 14 | 271,936 | | 78 | 271,952 | | 35 | 271,968 | | 10 | 271,984 | | | 272,000 |
| | 95 | 271,921 | | 25 | 271,937 | | 143 | 271,953 | | 37 | 271,969 | | 27 | 271,985 | | | 272,001 |
| | 140 | 271,922 | | 30 | 271,938 | | 156 | 271,954 | | 52 | 271,970 | | | 271,986 | | | 272,002 |
| | 177 | 271,923 | | 73 | 271,939 | | | 271,955 | | 60 | 271,971 | D21— | 89 | 271,987 | | 63 | 272,003 |
| | 194 | 271,924 | | 356 | 271,940 | D12— | 110 | 271,956 | | | 271,972 | | 120 | 271,988 | | 94 | 272,004 |
| | 198 | 271,925 | | 395 | 271,941 | | 147 | 271,957 | | 61 | 271,973 | | 232 | 271,989 | | | |
| | 244 | 271,926 | D9— | 414 | 271,942 | | | 271,958 | | 80 | 271,974 | D23— | 52 | 271,990 | D27— | 36 | 272,005 |
| | 250 | 271,927 | | 415 | 271,943 | | | 271,959 | | 111 | 271,975 | | 94 | 271,991 | D28— | 5 | 272,006 |
| D7— | 13 | 271,928 | | 416 | 271,944 | | | 271,960 | D15— | 7 | 271,976 | D24— | 4 | 271,992 | | 83 | 272,007 |
| | 24 | 271,929 | | 452 | 271,945 | | 151 | 271,961 | | 140 | 271,977 | | 17 | 271,993 | D32— | 66 | 272,008 |

## CLASSIFICATION OF PLANTS

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| P.— | 7 | 5,164 | 18 | 5,165 | 74 | 5,166 | 79 | 5,167 | | |

# GEOGRAPHICAL INDEX

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

1 : 4,422,331
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4 : 4,422,249
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